American Bee Journal

Vol. 95 No. 7 JULY 1955

Throughout the World "ROOT" is Synonymous with Quality

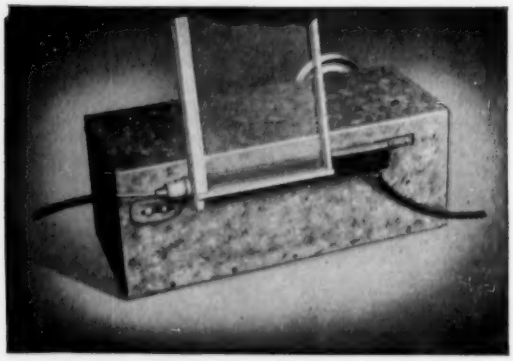
In German: Qualitat

In French: Qualite

In Spanish: Calidad

Language Is no Barrier to the Wide Reputation of Root Quality . . .

. . . Whether It Be



1. Uncapping Knives

The famous Root uncapping machine shown here will uncap three to five combs per minute. The steam heated blade vibrates back and forth at the rate of 700 to 900 strokes per minute and makes a clean cut rapidly. Root dealers also feature steam, electric, and plain hand operated uncapping knives at economical prices.

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Whether you choose a 20 or 45 frame Root extractor, all are built for rugged durability and maximum efficiency. Combs are thoroughly extracted and there never is a film of honey remaining in the cells. The lever control provides floating acceleration and allows the extractor to gain speed without damaging the combs. Write for free folder on extracting equipment called, "More Honey through Modern Extracting Equipment."

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THE AMERICAN BEE JOURNAL

HAMILTON, ILLINOIS

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Comments

WISCONSIN—A high per colony yield is nice to brag about but it is not the final yardstick by which to judge. Neither is production per man hours of labor. The final judgment should be based on the cost per pound and the net earnings. On this basis I favor Starlines. However more breeding work may show the grey bees better because of their excellent wintering, and such bees may have more resistance to Nosema. Often we do things with bees that are ineffectual. Perhaps I should quote Mraz who says: "Nature took care of bees for thousands of years before man acquired the intelligence to bungle things."—Stephen Treakle, Holcombe.

CALIFORNIA—I wonder what our pioneers and rugged individuals would think if they could see some of the methods employed by our big outfits today to gain power? Were those earlier men suspicious of their neighbors? Did they have to use power and force? Did they use tricky connivance to gain an objective? Or did they use methods of honest consent to gain the foundations on which they built? I can find much today to illustrate how different things are now but naming names may be too unkind. Let's get back some of our individual initiative.—Troy H. Nance, Sacramento

NEW YORK—We grow berries, including strawberries and raspberries. The berries and the bees were hobbies years ago while I was a professional musician. When the music business collapsed I went into industry to keep going but I still stuck with these sidelines. The berries fit in nicely with beekeeping. It is not hard to learn although it does require quite a bit of preparatory work to get the soil in good condition and to get rid of the weeds. About music, I joined Barnum and Bailey's circus when I was 19 as a musician in their nice forty piece band. They were then back from three years in Europe and were loaded with men picked up over there, England, France, Belgium, Germany. We went way to the Pacific Coast, through your country, up through Montana, Washington, a week at the Lewis and Clark Exposition in Portland, on to California, back through El Paso, closing at Little Rock. What a trip; 36 weeks! —Richard P. Mattice, Liverpool

CALIFORNIA—I think your format has improved but the series on Vermont folk medicine in my opinion have little to recommend them. Strikes me as being too much like Hadacol. If the doctor had some definite proof concerning the physiological effects of honey it would speak for itself. Relief from many conditions resulting from psychosomatic factors (things "all in the mind") can be cured by faith in almost anything—gods, spirits, idols, witch doctors, pills, even diet. In brief if honey is so good, let's have the proof, backed by something other than speculation. The benefits of honey are found in a myriad of other foods and people have lived in good health without ever using it. I eat honey and consider it an excellent sweet but only because it appeals to my taste.—K. W. Tucker, Davis

TEXAS—The U. S. Forest Department or the rangers harvest the timber but they recommend cutting or deadening all trees with holes in them. This would mean a loss in the number of squirrels, birds that peck, and many that feed on the insects. It would also destroy many colonies of bees that add to our pollination resources.—A Reader, San Antonio

Abroad

France

Royal Jelly Injections Authorized . . .

According to L' Apiculteur for April, the sale of ampoules of royal jelly for injection purposes—intramuscularly has been authorized in France. Pharmacists may sell them by special prescription. This measure was taken after studies in divers hospitals were most carefully made and certain results of highest interest were obtained. The magazine announces that it will publish exclusively, further details in subsequent issues.

Royal Jelly Book in French . . .

R. Fayolle is the author of "Comment Produire, Recolter, Conserver, et Vendre Votre Gelee Royale." In short a book on producing, gathering and selling royal jelly. After presentation of the composition of royal jelly, a quite large part of the book is devoted to its production. Apparently our own queen raisers in the South already are in a position to produce as effectively as anyone. The jelly should be gathered from cells with larvae not over 3 days old, and stored in controlled cold temperatures.

Some recipes are given for its use in face creams and other cosmetics. The percentage of royal jelly used in these preparations seems quite insignificant. Yet such preparations seem to meet with high satisfaction. We yet are in the dark on much of nature's manifestations. The book is paper bound, 160 pages. Copies in French may be obtained by sending a dollar bill to the author above at 32 rue Francois Miron, Paris 4, France.

Australia

Big Flood in New South Wales . . .

The Australasian Beekeeper, published in West Maitland, New South Wales, by Messrs. Pender Brothers, had a very much abbreviated March edition due to floods in their section. In fact the whole force of Pender Brothers as well as their building, whose main floor remained untouched, was used for refugee and rehabilitating purposes. Anyone who has seen a flooded area immediately after the flood subsides will realize the mud and mess necessary to revamp. Theirs was an "Operation cleanup," the magazine, meanwhile being printed in Newcastle. Detail of damage to apiaries and beekeepers' holdings is not specified.

Sweden

Spray Damage Wide Spread . . .

A Swedish publication has just come to hand devoted to a study of the difficulties and losses due to spraying rape in Sweden. In that country, as in other European countries, rape is a good nectar producer. The article comes to no conclusions as to a remedy, except that the colonies either should be closed for two or three days after spraying, or the movement of bees away from the spray danger, which is not much of a solution.

Soil Conservation and Beekeeping

by Roscoe Johnson and Benjamin Isgur*

SOIL conservation districts assist all kinds of farmers in developing conservation programs. Farm plans have been written for dairymen, orchardists, market gardeners and poultrymen. However, one group of farmers, namely beemen, have been neglected. This neglect may be due to the fact that most beemen do not realize that the soil conservation program offers much to them. Recently at a group meeting of 60 beekeepers, Roscoe Johnson, one of the authors, pointed out how a land use capability map can help beemen's operations and at the same time improve land use on their own farms and those of their neighbors.

There are approximately five thousand beekeepers in Massachusetts, 20,000 in New England and 600,000 in the nation. Although in New England there are few commercial beemen in the sense that they gain the major part of their livelihood from beekeeping, many farmers keep bees as one of their enterprises. Many orchardists and vegetable growers keep bees for pollination purposes since some have found renting bees for this purpose unsatisfactory. The major value of bees to society is not the honey and wax which they produce, although these are certainly valuable products; but bees are believed to be about twenty times more valuable as pollinators of fruit, vegetable, and clover flowers essential to fruit and seed production.

It has been shown repeatedly that orchardists and vegetable growers cannot rely on wild insect pollination. Where there are no honey bees, pollination is haphazard and there is a marked reduction in the setting of fruit. The honey bee is also important in the production of most legume seed. Honey bees are valuable because they can be controlled as to population and location. This is not true of wild bees and other pollinating insects.

The development of a soil conservation program for the beeman (whether beekeeping is only one of the farm ventures or a full time commercial enterprise) fits in admirably with proper land use. Primarily, that portion of the soil conservation plan which pertains to beekeepers is written around an all season "bee pasture" program. This "pasture" program is analogous to the all-season pasture program for cows. In both cases, normally, there is a lush period as well as a critical period during the pasture season; and again in both cases special crops must be provided during the critical period. In the case of bees, this special crop in Massachusetts could well be sweet clover.

Bees like all living organisms must eat. The food of bees is pollen and nectar (in the form of honey) which they must have throughout the working season. Since each plant specie only blossoms during a short period of time, it is necessary to make available to bees a variety of plants so that there will be in blossom some specie at any given time. By careful planning, bees will have a continuous supply of blossoms from which they may satisfy their immediate need for food and also store supplies against winter. Of course the beekeeper is interested in having the bees so well supplied with food that they will be able to store a quantity in excess of their needs. The honey bee is the only domesticated animal serving man that gathers its own food in the summer and stores a surplus for winter use.

Mr. and Mrs. Ralph L. Easterbrook of Dudley, Massachusetts, shown in the midst of a sweet clover stand which furnishes excellent food for bees throughout the summer.

Bees, in their search for pollen and nectar, perform their greatest function for animals in general and man in particular by cross-pollinating flowers which normally cannot pollinate themselves. They thereby insure the fertilization and setting of seed and fruit. As mentioned above, there is usually a critical time when bees cannot find sufficient blossoms to supply their daily needs. During such times bees will feed on the material which they have stored in the past and thereby reduce the total amount of honey which is available to the beeman. Even more important is the fact that many colonies are reduced in numbers by starvation. Consequently, robber bees from infected colonies may introduce disease. Also, weak colonies are not in condition to do the kind of job that is necessary to effectively pollinate crop-producing flowers.

One important element of a soil conservation plan for the beekeeping enterprise is the use that can be made of odd areas that should be retired to wildlife shrubs. On many farms this part of the soil conservation program needs strengthening. The soil conservation plan therefore should provide for an all-season "pasture" on adapted sites, and since a good many plants that bees can use are also of use to wildlife, that part of the soil conservation program is benefited. Many of these species can be planted on Class VII and VIII land, and this is one way of encouraging farmers to utilize such lands for the planting of wildlife shrubs. Class VII and VIII land, as may be seen from Figure I, a chart showing "Relationship of Land Use Capability Classes to Safe Land Use," is land suitable only for woodland and wildlife. The bee can forage economically within a ½ mile radius and therefore the beekeeper can afford to plant wildlife shrubs on many small class VIII areas even if these are on his neighbor's farm. This offers a splendid opportunity for cooperative agreements among farmers. At the end of this article there is a check list of plants which may be used in

* Dr. Benjamin Isgur is soil conservationist on the Massachusetts State Program Staff for the U. S. D. A. Soil Conservation Service located at Amherst, Mass. Roscoe E. Johnson works in Barre, Massachusetts for the U. S. D. A. Soil Conservation Service. Mr. Johnson was formerly a deputy apiary inspector for the State of Massachusetts.

LAND USE CAPABILITY MAP

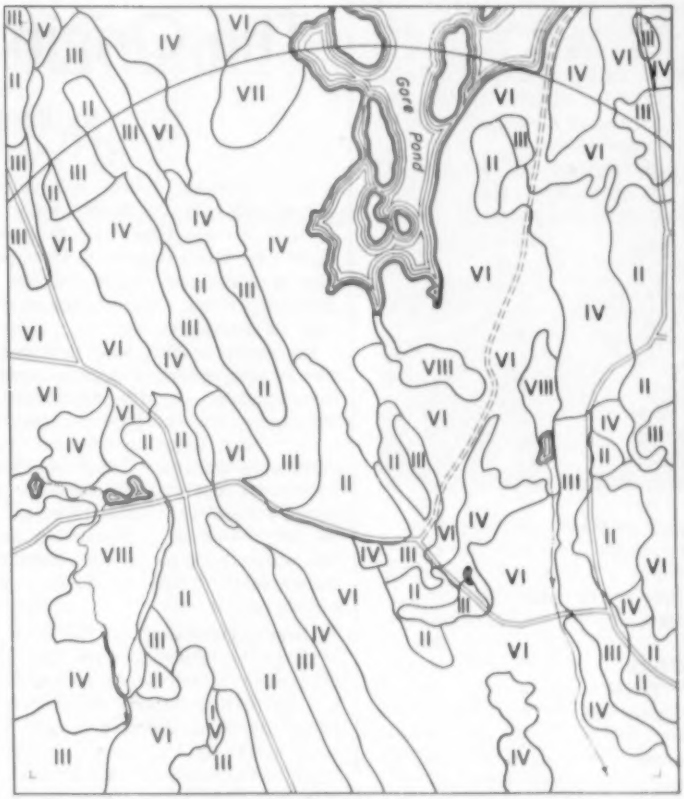
Relationship of land capability classes to safe land use: I Suitable for all uses. Cultivation requires only ordinary farm practices — II Suitable for all uses but simple conservation practices are needed when cultivated — III Suitable for all uses but intensive conservation practices are needed if cultivated — IV Suitable for all uses but cultivation should be limited — V Suitable for pasture, woodland, or wildlife — VI Suitable for extensive pasture, woodland or wildlife — VII Suitable for woodland or wildlife use. Usually not suited to pasture — VIII Suitable in some cases for wildlife production or recreation. Not suitable for the economic production of cultivated crops, pasture or woods.

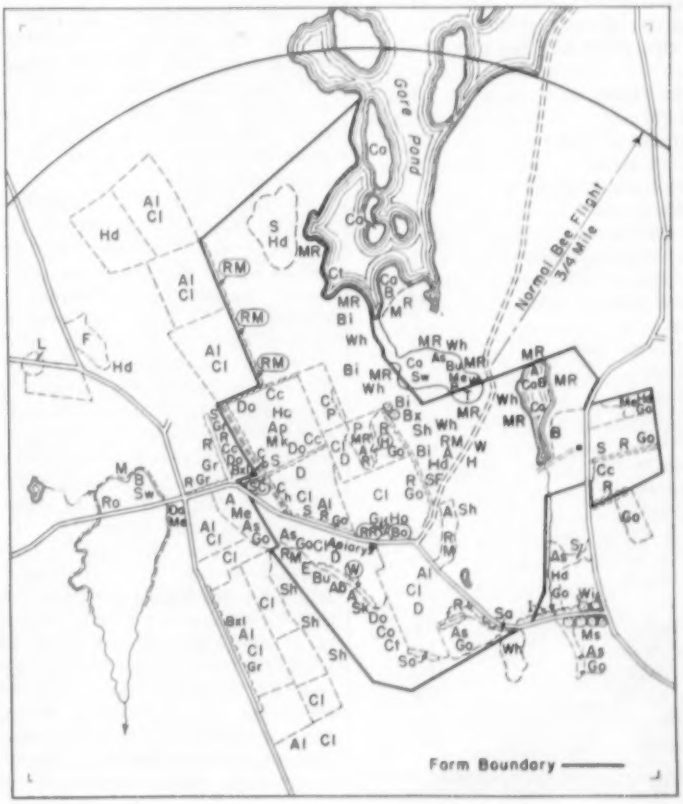
central Massachusetts for bee pasture. From this list, a bloom calendar may be prepared which would be useful for choosing proper combinations of plants for an all-season bee pasture program.

In developing a conservation plan, the farmer and farm conservation planner make a survey of the bee flight area of the farm to check off those plants which are in sufficient supply, and discuss the weak spots in the bee pasture program. Suitable Class VII and VIII sites for bee pasture should be located and adapted varieties of bee pasture plants recommended. As an example, in central Massachusetts, yellow sweet clover plays a very important part in the bee pasture program because it blooms at a time when there are few native bee plants in blossom. This legume may be planted on class VI land (land suitable for grass or trees but not suitable for cultivated crops) which should normally be in permanent grass. Yellow sweet clover reseeds itself and once well established need not be reseeded for a good many years. Here again the beeman's soil conservation plan fits in with proper land use and helps him use his land according to its capability and treat it according to its needs for protection and improvement. Figure I is a sample of a soil conservation plan made for Ralph Easterbrook of Dudley, Massachusetts, an orchardist who also keeps bees as part of his enterprise. Ralph, who is also a Soil Conservation District Supervisor, had one outstanding weak spot in his bee pasture program and that was taken care of in his farm conservation plan as noted on the revised land use map.

REVISED LAND USE MAP

Essentially, a soil conservation plan consists of a Land Use Capability map (indicating proper land use) and a Revised Land Use map (describing land use and treatment). These maps are from the Farm Conservation Plan of Ralph L. Easterbrook of Dudley, Massachusetts. The Revised Land Use map shows what bee pasture plants were present. New plantings (in circles) are to be added to provide season-long pasturage. With the help of the LUC map, plantings were selected in accordance with their soil and moisture requirements. Key to symbols is shown on Field Check Sheet on next page.





Beemen, whether commercial or part-time, may request a conservation farm plan by application directly to their soil conservation district, or to the district through their county agent or local Soil Conservation Service office.

***CHECK SHEET OF DESIRABLE PLANTS TO PROVIDE SEASON-LONG BEE PASTURE**

Plant	Map Symbol
Crocus	Cr
Skunk Cabbage	Sk
Alder	A
Pussy Willow	W
Poplar	P
Elm	E
Red Maple	MR
Spicebush	Sp
Cassandra	Ca
Weeping Willow	Wl
Box Elder	Bxl
Norway Maple	MN
Sugar Maple	MS
Cowslip	Co
Gill over the Ground	G
Rhodora	Ro
Shad	Sh
Dandelion	D
Black Birch	Bl
Pin Cherry	Cp
Apple	Ap
Sassafras	Sa
Blueberry	B
Choke Cherry	Cc
Tatarian Honeysuckle	H
Joe Pye Weed and Boneset	P-B
Aster	As
Witch Hazel	Wh
Red Pine	Pl
Wild Black Cherry	Cb
Rugosa Rose	RR
Blackberry-Raspberry	R
Black Locust	L
Orange Hawkweed	Ha
White Dutch, Ladino and Alsike Clovers	Cl
Yellow Sweet Clover	SC
Grape	Gr
Multiflora Rose	RM
Alfalfa	Al
Sumac	S
Dogwood	Do
Dogbane	Db
Winterberry	Ab
Milkweed	Mk
Fireweed	F
Sweet Pepperbush	Sw
Purple Loosestrife	Lo
Hollyhock	Ho
Cattail	Ct
Basswood	Ba
Meadowsweet	Me
Hardhack	Hd
Buttonbush	Bu
Goldenrod	Go
Boltonia	Bo

* Compiled from the records of Sunnycroft Fruit Farm, Barre, Massachusetts.

The Origin of Bee Scents

by Ronald Ribbands

IN a previous article I have explained how we have found out that honey bees can recognize their hive mates because they possess a distinctive smell, which is different from that of the honey bees of other colonies.

Discovery of this fact provided a fascinating problem which needed investigation. It was necessary to determine the mechanism whereby honey bees come to possess these distinctive odours. Using the same apparatus and similar methods, we showed that the distinctiveness of the odour was not an inherited quality—sister bees in divided queenless nuclei might come to possess different odours.

Scents Derived from the Diet

These experiments were followed by another series, which proved that the distinctive odours were derived from the food supplies which had been eaten by the bees. The new experiments were of two kinds.

In the first set of experiments, a colony was deprived of its queen and divided into portions in October, at a time when bees were not foraging; different portions fed with different kinds of honey developed recognition differences, but different portions fed with the same kind of honey did not.

In the second set of experiments, several colonies were taken to an extensive moor, where they could obtain nectar from **only one** kind of flower, namely ling (**Calluna**). On arrival at the moor, the bees were shaken onto empty combs, so that they had no reserve food supplies. They were left during August and September, and soon afterwards experiments revealed no recognition differences between these different colonies—which had been feeding on the same diet, and so had come to possess the same odour.

Food Sharing

These results in turn suggested still more interesting problems. It is easy to understand how all the bees in a colony acquire the same scent when the food supply is homogeneous, as in the instance just cited where all the bees fed on the same kind of nectar, but it is not easy to understand how they all produce the same scent when a mixture made up of many different kinds of nectar is taken into the hive.

Another set of experiments answered this question, by demonstrating that the mixture of foods taken into any hive is evenly shared among all the bees in that hive. For these experiments, radioactive sugar prepared by the Radiochemical Centre at Amersham was used. The procedure for these experiments is quite simple. A marked bee is trained to collect sugar solution from a small glass tube, and when radioactive sugar is substituted the bee proceeds to collect the radioactive sirup quite happily. The bee returns to the hive carrying its fill of radioactive sugar, and what happens to that "labeled" sugar after it enters the hive can be followed with comparative ease. Every bee that receives some of the radioactive sugar can be identified by means of a Geiger counter. By collecting a sample of bees from the hive one can discover what proportion of the colony has acquired some of the radioactive sugar, and by taking periodical samples it becomes possible to find out the rate at which the sugar is being distributed through the colony. Some striking results have already been obtained in this way, and some have already been published; other experiments which promise to give even more exciting results are still in progress. I have now shown that one bee-stomachful of radioactive sugar can be shared out among almost all of the bees in a large colony.

These facts about the food-sharing habit can explain the results of the field experiments on bees' scent. The floral nectars and pollens brought into any colony contain the different and distinctive scents of the different flowers from which they come. When those foods have been digested, derivatives of those chemicals which account for the various floral scents accumulate in the scent glands of the bees, and because each bee in that colony has received a more or less equal share of each and every item of food reaching the hive each bee will produce a similar scent.

The Different Food Supplies of Neighboring Colonies

The food - sharing experiments showed how the bees in any one

colony come to share the same foods, and so to produce the same odour, but this is but one of the conditions necessary before the food-derived odours will enable the bees to distinguish between the scent of their companions and that of the honey bees of other colonies.

Of equal importance, the bees of different colonies must obtain different mixtures of foods. Why should this happen, even if the colonies happen to be in the same apiary?

In each colony many thousands of bees are collecting food supplies—and if these bees foraged quite independently, neighbouring colonies would obtain almost identical mixtures. However, the well-known discoveries of Prof. Karl von Frisch have explained why this does not happen. He proved that successful foragers, returning to their hive, give samples of their booty to their hive mates so that they may know what scented food to search for, and immediately afterwards the foragers perform a dance which tells their hive mates the direction and distance of the crop from the hive.

Von Frisch's students have shown that this message system is so widespread that bees seldom need to find new crops for themselves; nearly all of them collect from crops which they have been told about. In consequence the colony, not the individual bee, becomes the foraging unit, and neighbouring colonies usually gather quite different proportions of the various kinds of nectar and pollen which are available to them.

Thus, by food sharing between forager and recruit, different colonies collect different food supplies, and by food sharing between all the bees of each colony these supplies are so evenly distributed that the bees of each colony produce the distinctive odour which enables them to recognize one another.

Rothamsted Experimental Station, Harpenden, Herts, England

The 1954 Honey Stabilization Program

The Government Commodity Stabilization Service reports that as of April 15, 1955, there were loans outstanding on honey only to the amount of 16,000 pounds. Loans made during the season totaled 1½ million pounds with only 7 thousand pounds delivered to C.C.C. During the season 755 thousand pounds were placed under purchase agreement.

Promoting Honey

by G. Chester Freeman

Taken from a statement by Mr. Freeman of the Agricultural Marketing Service, Washington, D.C., made at the Annual Convention of the American Beekeeping Federation, Chicago, January 26.

ONE of the most interesting and challenging promotions we have had the pleasure to work on over the years was the program working with you a few years ago to sell more honey. I want to share with you some of my observations, from both the industry and Government sides of the fence, on what producer groups can do to promote a product in a field as highly competitive as food merchandising.

Honey is one of the scrambling items in the food market—one that must fight hardest for its share of the consumer's food dollar. If you lose just a small share of the market for your crop, you're in trouble. If you can expand your market just a little, you're in. That boils down to promotion—a good aggressive job of promotion can gain you that expansion you need. And if you don't promote aggressively, you can be sure your competitors will be promoting and possibly taking your share of the market.

Back in 1952 the honey industry needed marketing help. It was faced with the problem of moving the largest crop in history. Since this was a case of real need we were able to help you through our Plentiful Foods Program operations. Because of your fine efforts and what assistance we were able to provide, over 10 million more pounds of honey were moved through normal trade channels than during the 1951 season. That proved that honey was an item which could be promoted and could pay rich returns. Further proof came in 1953 when we again cooperated in honey promotion.

This past year, you have not needed our help in marketing your crop. But we're glad to see you have not abandoned your promotional activities simply because you have not been burdened by a surplus. We're glad that you, and the leaders of your industry, have wisely realized that there's no standing still in this great food business. Promotion-wise, you have probably arrived at the dangerous age. Three years ago, marketing was a real problem for you. Two years ago, not so much. This year, still less. What now, of the future?

What will happen next year, or any year when nature gives you a big crop? Remember that this year, when you've had less honey to sell, you've probably lost customers to competitive product items. People who couldn't get honey at the price they wanted to pay have spent their food dollars on other things. Even if you had them sold on honey two years ago, you'll have to sell them all over again next year, or whenever that big crop comes in. That's the situation that makes it doubly dangerous to let down in food promotions.

I am well aware of the excellent promotion work that is being done by your industry associations and by many of you personally. Your Marketing Committee and the American Honey Institute have done a fine job. Local beekeepers and associations are also doing an aggressive job of honey promotion. But I wonder whether you're taking full advantage of your opportunities to make direct personal contact with the food industry, and information media, and others in a position to help the sales of honey at the state and local level? It is fortunate that honey is produced in every section

(Please turn to page 282)

Introducing Ten Thousand Queens

by H. L. Maxwell

The writer takes "time out" near a queen and package yard in the "low country" near the Savannah River. The log is an ancient cypress. This picture is of a time "back when"—17 years ago.

I HAVE been buying and introducing queens for over 20 years. I also raised queens in considerable numbers until we became too busy as commercial operators to do so, although each season we find some exceptional colonies in our apiaries, the queens of which are potentially fine breeders. We have purchased and introduced over 10,000 queens during this time.

We keep no records of queens as to age and only replace queens that are obviously poor or failing, or else use them with divisions to make up winter losses or for increase.

One unusual fact stands out in our beekeeping and that is we feel that over 25% of our colonies requeen themselves by supersedure each year. I see many illustrations of this in a day's operation among the bees. We have virtually no swarming with our system and I count on supersedure as being the most dependable method of requeening colonies. I have seen little or no reason to attempt to supplement the bees' own system in this respect.

Until recent years, our success in queen introduction has been highly variable, but for the past two or three seasons we have been uniformly successful. This past season, for example, we purchased and introduced 570 queens and lost no more than a dozen. I shall try to explain briefly how I think we have achieved such gratifying results.

First, I would like to emphasize that we use no **trick gadget** or **special method.** We simply follow a streamlined routine — a sort of "know-how" about bee behaviour that we have acquired through years of close association with the bees. Bees are very much like people, only more consistent in their reactions; and we have come to recognize a basic principle in their behaviour in our introduction of thousands of queens. Right now, let me state this principle: **acceptance of a queen, other than their own, is not a natural occurrence in a colony of bees—they accept a stranger queen only under compulsion.**

So we proceed on the assumption that we must compel the bees to accept a queen, always. Almost any method, trick device, or procedure will work so long as the **principle of compulsion** is also present. Perhaps this sounds disappointing as a formula, but it took us years to arrive at this simple conclusion, and the loss of hundreds of dollars' worth of queens lost in introduction. This principle can be applied in a great variety of circumstances, and the use of the ordinary mailing cage is all that is necessary in queen introduction.

Perhaps I can add clarity to the subject by digressing a moment: first, in our trustful trial of most of the methods and tricks recommended in bee literature and by breeders for safe queen introduction, we sometimes would have amazingly good results and would feel that we'd licked the problem. Then we'd plumb the depths again with heavy losses. In this, we assumed there was nothing new—that the old masters had really exhausted "the diggings." It required years—many years—of rugged trial and error to overcome this **mental block.**

We've tried every method of queen introduction, one time or another, of which we've ever heard. Our average of success, though, in previous years was so variable, that we purchased queens only when we felt we simply had to have them. Looking back, oddly enough, most of the **methods recommended included some form of torture,** and it would appear that the authors sensed the need to **make** the bees accept the queens.

For example, there is the "smoke method" — (pretending "your house is on fire"); the dunking or daubing in honey method; the caging or "jailing" method (this in many versions —mailing cage, Smith's pin-on, Miller's, the match-box, etc.); the "eviction" or shaking method; the suffocation or "uniting by paper" method —(this might also be called the "dueling" method since the queens are left to fight it out between themselves); and newer methods such as the use of phenol and "laughing-gas," and ad infinitum.

All of these methods would work some of the time, but none of them ever would work all of the time. Why? Where did we slip up? Certainly, we gave the queens and the bees the "works" according to rote. As we reached our peak as commercial apiculturists, the need of several hundred queens annually continued to press upon us, and we continued to look for a simple and "sure" method of introduction. . . . (I always get a thrill out of safely introducing a queen, and the loss of one can be equally depressing to one's morale).

I like to say that we did not learn to keep bees until we got our noses out of a beehive, and began to think of a beeyard; then, of uniform beeyards; then, of a simplified, streamlined procedure of operation or manipulation that would apply to all forty of them. . . . And, along about this time, as we muddled along, we began to recognize some of the salient features associated with the successful introduction of queens (features that stand out in stark simplicity as we look back upon the panorama of tens-of-thousands of colonies of bees observed during the past 20 years. . . .)

There are three basic conditions (each, with some sub-divisions) when the principle of compulsion will always apply, and, after diagnosis to determine which condition exists, it is easy to detail the pro-

During the honeyflow, in the Shenandoah Valley of Virginia. L. to R., Lit Maxwell (14), Harry Greinciscn, Duke Murray.

cedure for introducing the queen. I shall list these three conditions and their logical sub-divisions:

1. Hopelessly queenless bees.

A. A package of bees that has been shipped without a queen. (We buy all our packages this way.)

B. An emerged swarm that is, by whatever means, queenless.

C. A colony of bees that has been de-queened, and from which all brood (preferably, if old bees are present in majority) or, all unsealed brood has been removed. (An ideal example of this situation is a normal colony that has been "shaken" for swarm control, with old or parent hive containing the brood and young bees being removed to a new stand.)

D. By removal of the queen and brood from a colony that has a drone-laying queen, preferably—after killing the queen—shaking bees off combs into their hive, also supplementing strength by adding, through shaking, some bees from another colony, closing hive, and moving to another apiary, adding broodless combs containing honey and pollen at time of manipulation.

2. Queenless colonies, with brood.

A. A parent colony with brood in all stages, with mostly young bees, that has been moved to a new stand in the same apiary—(see parenthetical note in I, C.).

B. A parent colony with only sealed brood.

C. A food-chamber containing brood that has been taken off a normal colony and moved to a new stand in the same apiary, allowing old bees to drift back to old stand since there will be a preponderance of young bees in such a unit anyway. (Even so, we prefer to close and remove such a food-chamber to another apiary because of occasional heavy drifting, also danger of robbing before such a division establishes itself.)

3. Drastic demoralization. (Through moving.)

A. Dequeening a normal colony, then closing and moving to another apiary.

B. Making up nuclei from normal colonies, composed of brood and bees of all ages, closing and moving to another apiary.

C. "Smoking," "gassing," or wetting down with sirup. (We seldom use these any more.)

We immediately introduce the queen by placing the cage between the frames or on top frames, wire down, reversing inner cover to allow room for cage, in all of the above situations. Other things that we do that we think important are: we use as little smoke as we can get by with; we use ordinary mailing cages for the queens—with candy—**but without attendant bees.** (We prefer this, although we've been just as successful using queens with attendant bees.) We order our queens in battery cages, either 50 or 100, with two or more pounds bees to cover and protect the caged queens. When we introduce the queen, we remove the paper strip over the candy and allow the bees to eat through and release her.

We always order our packages to arrive queenless. (The writer hived 104 packages last spring in a single operation and obtained safe introduction of 104 queens. Not a single loss!) We often obtain our queens from a source different from that of the packages, but always insist on battery cages. We can transport the battery cages from apiary to apiary, leave them overnight on our truck safely, or leave them in the apiary on a stand just like a hive. The queens will keep fresh for many days, just keep adequate feed in the feeder can for the covering bees. We often are able to introduce the last queen to the covering bees and hive them as a package.

There is one final, important feature. We have a nice substitute for smoke. We keep a quart can of sugar sirup handy by us, with the lid perforated with several small holes, and this sirup is strongly flavored with oil of peppermint. We sprinkle the bees lightly before giving the caged queen, and they shy away from it just like smoke! (Nb: due to odor factor, this sirup might qualify under No. 3 C.)

To sum up. We find we can expect safe queen introduction if any of the three basic situations, or subdivisions of those mentioned, exist at the time. **Compulsion** is, we believe, the controlling factor. But, we can help materially by making other conditions, under our control, as hospitable as possible.

Virginia

Queen Bee Cream . . .

In a large advertisement in the Des Moines, Iowa, Register, Jane Wilder, of the famous Younkers store, extols the merits of Marie Earle's Queen Bee Cream with royal jelly by Lilly Dache, at $15 a jar (plus 10% Federal excise tax). Whew! What a price for the ladies to pay for beauty. Best line—"It's Royal Jelly that makes the Queen Bee live 38 times as long as other bees—"Grandmas will now carry the look of young brides. But, what about us old granddads?

Twelve Thousand Colonies!

In Gleanings for June, R. B. Willson tells about Miel Carlotta, Mexican beekeeping establishment with 12,000 colonies of bees, in 210 apiaries, a crop of over 250,000 pounds of honey this past season, queen production at the rate of 20,000-25,000 a year! Partners Arturo Wulfrath and Dr. Hans Speck. Willson invites comparison claiming them to be "the champions". No dispute out of us, Bob. Maybe Woody Miller would be runner-up?

A New Approach to Comb Honey Production

by W. S. Zbikowski, M.D.

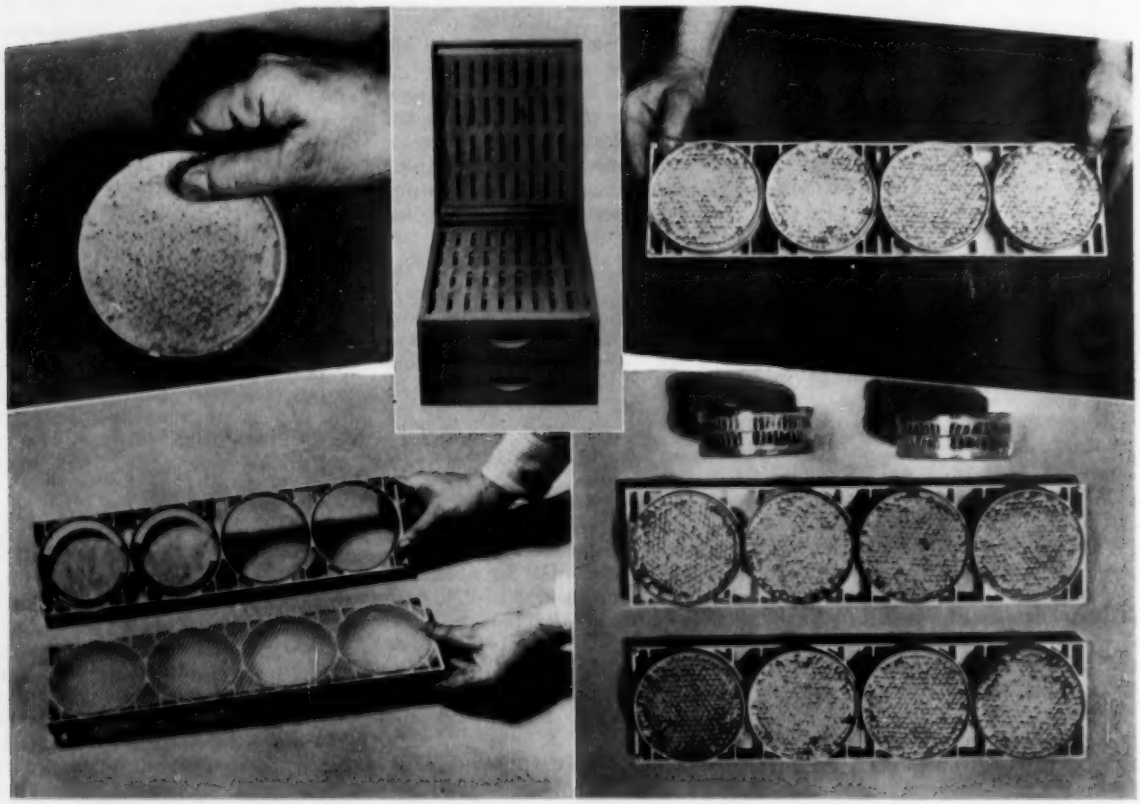
A FEW years ago, the writer became interested in honey and bees. After reading available literature on beekeeping, he decided to have a try with a hive or two. The first year was spent observing how the bees worked and trying to raise comb honey. It was felt that extracting would require too much equipment and housing facilities for an amateur. While very few good comb honey sections were obtained, many interesting observations were made. It was observed that where honey and brood occurred in patches in the brood frames that these patches tended to be circular in form. The unfilled comb honey sections were usually of such a character that only the corners were left empty showing again the circular pattern.

These observations led to the idea of a circular comb section. It was not practical to make this of wood, so plastics were the only solution. The first sections were made from Plexiglass tube, cut off and set into round holes in solid wood frames. It was amazing how the bees took to the plastic sections and how quickly they filled and capped these sections to the last cell.

The plastic seemed to be much more acceptable to the bees than wood as they drew the edge cells out from the foundation, storing the honey directly in contact with the plastic. In wood sections the bees make these part cells of wax and do not store honey in them. This is a waste of honey, wax and bee time.

The next year found us with a die made for a half section of Styron plastic. Two of these halves are used with the foundation between. These worked very well but were too hard to get out of the wood frames and did not provide for a sheet of foundation over the four sections in each frame. A symmetrical half frame was designed and made of Styron plastic. This makes for a quick unloading and reloading of supers and allows a strip

(Please turn to Page 282)

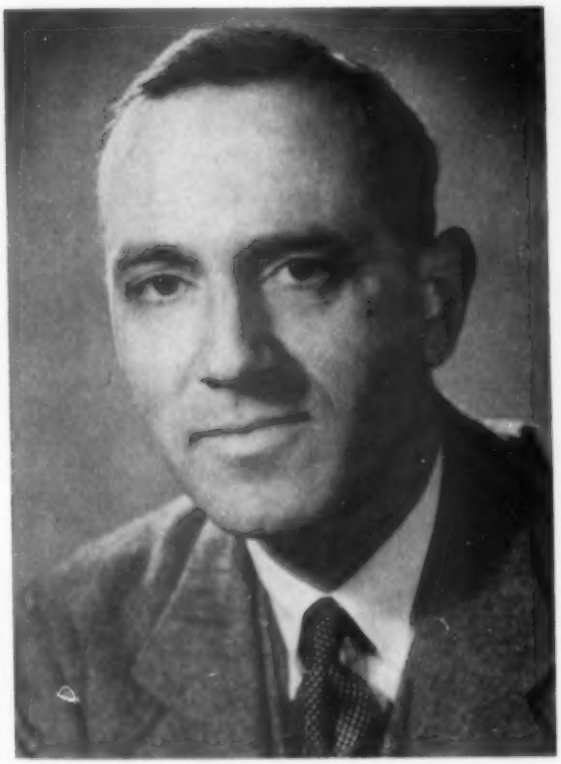


Upper left, finished section with covers ready for the customer. Top center, two supers with 36 sections each. Note the separators and lack of cracks between frames. Upper right, another view of filled sections. Bottom left, two half frames with half sections and foundation ready to be pushed together. Note the built-in separators. Bottom right, two plastic half frames with sections of comb honey filled to the last cell. Two top sections with covers showing honey directly in contact with the plastic.

The Role of "Queen Substance" in the Social Organization of a Honeybee Community

by Colin G. Butler

Bee Research Department,
Rothamsted Experimental Station, England



Dr. Butler is the author of "The World of the Honeybee", published by Willmer Brothers in London, one of the most recent of our books about the bee and one of the most exciting to read. His ideas on queen substance and its part in the life of the colony bring many new suggestions to the practical beekeeper in colony management. Dr. Butler is head of the Bee Department of the famous Rothamsted Experimental Station and has had a distinguished career since graduating from the University of Cambridge. His studies there were on white flies and locusts. He came to Rothamsted in 1939. Most of his writing has been on bee behavior. He has travelled extensively and visited here in the spring of 1946. In Ceylon he was an advisor on the use of the honey bee in the national food production drive. While there he secured considerable knowledge about the Asiatic species of bees, giving him a background to clarify the origins of the bee and its wonderful social organization. Butler's most fundamental contribution to our knowledge of bees is his discovery of the presence of queen substance with which this article is most concerned.

ALL true insect societies are families, each family consisting of the mother insect and her offspring who together share a common home. Insect social life in any highly developed state, such as that shown by a honey-bee colony, has evolved slowly through numerous stages during the course of millions of years. In each of these evolutionary stages an ever-increasing degree of intimacy is shown between the mother insect and her offspring, who share a home with her, and an ever-increasing degree of mutual cooperation.

It is in colonies of the European honey bee that we find the highest degree of social development amongst the bees. A very distinct worker caste is present consisting of sterile females — perhaps forty or fifty thousand of them—but each colony normally possesses only a single queen which is the mother of all the bees forming her colony. These queens have become immensely fertile and specialized for the job of laying very large numbers of eggs. In so doing they have lost the ability to build a nest, to feed their larvae, and even to collect food for themselves, these latter duties being carried out by the worker bees. Thus neither the queen nor her workers can get along for very long without one another. Furthermore, it is obvious that if each worker bee were to act quite independently of all the other members of her colony the result could only be chaotic; indeed the evolution of a division of labour amongst the members of a colony became necessary as soon as colonies came to consist of more than a very few individuals. Even amongst the bumblebees a rudimentary division of labour is known to exist although the colonies of many species consist of perhaps only thirty or forty individuals.

Now, although a worker honey bee can live for some time on her own, provided that conditions are suitable —for instance, in a properly equipped cage in an incubator in a laboratory —no individual worker will willingly do so. The great attraction that any group of workers has for any bee that is "lost" has been studied in France, by Lecomte (1950), and, later, in England, by Free and Butler (1955). The following is a very brief account of some of the results obtained.

If a hundred or more worker bees are scattered about in an empty box (say one about eighteen inches square) in the dark they will form a compact cluster together within an hour or two. But if, as Lecomte was the first to show, less than about fifty bees are scattered in the box the likelihood is that they will remain scattered and only form small, temporary groups, each of no more than three or four individuals. It would seem, therefore, that a certain minimum number of individuals have to be present before the instinct to cluster together is released. Similarly, it has been shown by Lecomte (1951) that a cluster of less than about one hundred bees seldom shows any sign of aggressiveness, or even of willingness to attack strange bees.

So it would appear that a certain, albeit small, number of individuals have to be present if what has been called "colony morale" is to be maintained—if the bees are to cluster together and defend themselves, and so forth.

I would like to discuss a little further the factors which are responsible for clustering and the maintenance of colony cohesion as they are, of course, of vital importance to the social organization of the honey-bee community and thus to beekeepers.

If we take two wire-gauze cages, one empty and the other containing a couple of hundred well-fed bees, and place them six inches apart in our darkened box and then scatter

a couple of hundred bees in the box, we will almost certainly find that the scattered bees will form two clusters, one on either cage, simply because the cages form convenient supports. Gradually, however, as the bees which have clustered on the cages begin to get hungry, those which have clustered on the empty cage begin to wander from it and join those which are already clustering on the cage containing the well-fed bees. In time a single cluster is formed on the occupied cage and no bees are left clustering on the empty cage. The hungry bees clustering on the occupied cage solicit and receive food from the well-fed bees inside. Hungry bees will even cluster on a cage which has double walls through which they are unable to make physical contact with the bees inside. However, if the bees in the darkened box are given plenty of food they are only attracted to the cage containing the other bees simply because it forms a convenient support upon which to cluster. Often they will cluster on the empty cage instead. It is obvious from these observations that hungry bees will cluster on the occupied cage rather than on the empty one in order to solicit food from the well-fed bees inside it.

As their social organization has evolved the honey bees have developed the habit, as have the ants and the termites, not only of the adult workers feeding the larvae but also of adults feeding other adults. Thus workers give nectar, or honey, to other workers and to drones, and brood-food to queens as well as to larvae and, as we shall see, something which I have called "queen substance" is also passed around the community from worker to worker. The sharing, at all events amongst the household bees of a colony, of this substance, which some of them obtain from their queen, is in fact probably the most important single factor in the social organization of the honey-bee community. So powerful, indeed, is the urge of worker honey bees to obtain queen substance that queenless workers will sometimes even desert young brood in order to join another group of bees which possesses a queen of some kind. There seems to be no doubt at all that the queen honey bee plays a vital role in the social organization of her colony, quite apart from her obvious reproductive function.

I decided a year or two ago, therefore, that it was very important to try to discover the exact nature of this relationship between a queen

Worker bees interchanging food which probably contains queen substance (From the "World of the Honeybee", the Macmillan Company, New York).

honey bee and her workers, and started to carry out a long series of experiments and observations on which I am still engaged. However, I would like to discuss some of the results already obtained.

Let us suppose that we have removed the queen from a colony and have placed her in a small wire-gauze cage. An hour or so later we shall find a number of bees running around in an agitated way on the alighting-board of the hive. Within six or eight hours, often within three or four hours, a much more definite sign of "queenlessness" will have become apparent as one or more worker brood cells containing young female larvae will have been modified to form emergency queen cells. The larva in one of these cells is, of course, destined to become the new queen of the colony.

However, let us suppose that an hour after removing the queen, before any signs of emergency queen cells can be found, we transfer the queen into another cage, and place the empty cage in which she has been confined on the alighting board of her hive amongst the excited bees. They react immediately and very definitely. Many of them climb on the cage and examine it thoroughly with their antennae, whilst others expose their scent glands and fan. Their behaviour is, indeed, very similar to what it would have been if we had returned the queen herself. After an hour or so, however, the bees appear to lose interest in the cage and to pay little more attention to it than they would to any other empty cage which had never contained a queen at all. It seems obvious that the cage in which the queen had been confined had become contaminated with something—with some substance, probably a scented one—from the queen's body which greatly excited the bees for a short time. It is interesting to note that any cage in which a queen has recently been imprisoned proves attractive to excited, queenless bees. It would, therefore, appear that all queens have something in common which is very attractive to worker bees—a most important point to be remembered when considering the problems of queen introduction.

From these and other observations, one is inclined at first to suppose that the members of a colony know that their queen is with them because her scent permeates the hive atmosphere and that, conversely, they realize when she is no longer present by lack of her scent in the hive atmosphere. Unfortunately, however, this simple and widely held theory does not explain all the known facts adequately. For instance, if we divide a hive into two parts with a vertical wire-gauze screen (through which bees cannot pass) placing the queen in one part and plenty of food and young brood in each part, emergency queen cells soon appear in the queenless part. Yet there is no doubt that any odour given off by the queen into the hive atmosphere can pass freely through the screen to the bees on the other side!

Now, during the early summer of 1952 I introduced, directly, a virgin queen to the bees of a colony which was headed by a mated queen and housed in a special observation hive. The virgin was seized by some of the workers and "balled." Many of the bees forming the ball tried to sting the virgin, but seemed to have great

The collection of queen substance. The second worker from the left is licking the queen substance from the body of her queen.

difficulty in so doing and, instead, stung and killed some of their own sisters. Presently, although only one virgin queen had been introduced, it was noticed that three "balls" had been formed. One contained the virgin, but neither of the others contained a queen. Why had these latter two "balls" been formed? Was it possible that the bees were attempting to kill the virgin because some substance on her body surface—her "queen substance"—smelled or tasted strange and unpleasant to them, and that a few of them had become contaminated with this substance and were being mistaken for virgin queens and balled in consequence?

Experiments were carried out to test this hypothesis. Worker bees from colonies headed by mated, laying queens were placed in close contact with the bodies of strange virgin queens for a few minutes and were then reintroduced into their own colonies. All were subjected to detailed examination and mauling, a few were "balled," and others were actually stung to death, whereas control bees which had not been with strange virgin queens were unmolested when returned to their colonies. This does, therefore, appear to be the correct explanation of such curious, queenless "balls."

From consideration of the results of these and other experiments the following working hypothesis was formulated. It was supposed that some of the members of a colony acquire something—probably a definite substance—from their queen, which she either gives to them or which they obtain for themselves by touching or licking her body. Further, it was supposed that those bees which obtain this "queen substance" directly from their queen pass some of it on, either deliberately or accidentally, to other members of their colony, which in their turn share it with still other bees. It was supposed that every bee in a colony continues to "feel satisfied" — queenright — so long as she obtains a share of this queen substance from time to time either directly from the queen, or from other workers.

This hypothesis was tested by dividing a large colony into three equal parts and transferring twenty worker bees from the part containing the queen into one of the queenless parts every five minutes. The other queenless part was kept as a control and, once set up, received no more bees from the queenright part. After four hours five emergency queen cells were found in this control part, but no emergency queen cells could be found in either of the other two parts.

It appears, therefore, that the bees that were taken every five minutes from the part containing the queen carried with them something which they had either obtained directly from the queen, or indirectly from other workers who had obtained it from her, and that the bees in the queenless part to which these bees were added detected this substance and "felt queenright" and so did not build any cells. The bees in the control section, however, did not receive regular supplies of this queen substance and therefore began to "feel queenless" and to build queen cells, as the inhibitory effect of an adeqaute supply of this substance was no longer operative.

Of course it is possible that the bees which were transferred from the part with the queen to the queenless part suggested to the bees in the latter that their queen was still with them by means of a signal of some sort. However, the queen substance theory was considered to be the more simple and probable explanation, and the considerable amount of evidence that has been collected subsequently strongly supports this view.

Now, although the ovaries of worker bees do sometimes develop to a limited extent when their queen is still present (Perepelova, 1929; Maurizio, 1954) in general it is true to say that the queen must be removed if the workers' ovaries are to develop quickly and to any considerable degree; if, indeed, laying workers are to develop. In order that this may happen, even when no queen is present, it is also essential that the workers should have a plentiful supply of protein (which, of course, they obtain from pollen) either in their diet or as reserves in their own bodies. It appears probable, therefore, that, as various workers (Hess, 1942; Butler, 1954; Pain, 1954) have suggested, normally in a queenright colony something obtained from the queen circulates amongst the workers and inhibits development of their ovaries. In fact, very recently, potent extracts of such a "queen substance" have been obtained by de Groot and Voogd (1954) and also by the author.

What is more likely, then, than that an adequate supply of the "queen substance" not only prevents the workers from attempting to produce further queens, but also inhibits development of the ovaries of the workers themselves?

If one and the same substance inhibits both the development of the ovaries of worker bees and their urge to raise queens, one would expect that the ovaries of the worker bees would develop whenever the quantity of queen substance in circulation amongst the members of a colony falls below a certain threshold and the bees build queen cells. That this does in fact happen was discovered a long time ago by Perepelova (1929), who found that the ovaries of some of the workers of colonies in which swarm cells were being built began to develop slightly.

Thus the queen substance theory is capable of explaining both the phenomenon of queen production and also that of the development of laying workers. It is a theory which is now based upon sound evidence and which begins to fit together a few of the pieces of the jig-saw puzzle of colony behaviour. Furthermore it

appears that a similar sort of mechanism inhibiting worker ovary development probably exists in both ants and termites. Indeed a German worker, von Bier (1954), has recently demonstrated its existence with several kinds of ants.

Well, of course, this is only a beginning and a great many questions still remain to be answered. Questions such as: From what part of the queen do the bees obtain queen substance? What is this queen substance and how is it obtained and transmitted throughout a large colony? (It seems impossible that every worker should receive a supply directly from her queen, as experiment has shown that each worker needs to receive a supply every few hours if her urge to rear queens is to remain inhibited.) How does the queen substance work? Let us consider each of these questions very briefly.

First of all, from what part of the queen is the queen substance obtained? This question was answered in the following way. Small colonies of bees in single brood chambers were each divided into two equal parts by means of vertical, bee-tight partitions. In the center of each partition there was a rubber diaphragm in which the queen of the colony concerned was supported in such a way that part of her body (say her head and thorax) was exposed to half the members of her colony, and the rest of her body (her abdomen) to the rest of her bees. The bees in both parts paid a great deal of attention to whatever parts of their queens they could reach and, besides feeding them, frequently licked their bodies. In no case did any of the groups of bees build emergency queen cells during the three or four days which each experiment lasted.

From the results of many such experiments, in which the bees were only able to reach certain limited parts of their queens' bodies, it was concluded that bees can obtain queen substance from all parts of the bodies of their queens provided that they can actually touch them, as it was found that if the bees were prevented from actually touching their queens, emergency cells were soon started. However, although it is clear that bees do obtain queen substance from all parts of their queens' bodies there is evidence that it is particularly abundant on the queens' heads. (Pain, 1954; de Groot and Voogd, 1954).

Data have also been obtained

Abdomen of queen exposed to half the members of her colony in an experiment to determine from what part of the queen's body bees obtain queen substance.

(Butler 1954) which indicate that anything which interrupts, or seriously reduces, the availability of this substance to the workers of a colony results in removal or reduction of the inhibitory effect and the building of queen cells. Thus I have been able to show that the bees of a colony commence to make preparations to supersede their queen because the amount of queen substance she is producing has become too low to continue to inhibit them from so doing. Again, it is probable that either a deficiency in the amount of queen substance available, or some breakdown in its collection and subsequent distribution, results in the workers tolerating eggs and larvae in queen cells preparatory to swarming. Indeed it is probable that, at all events in cases of supersedure and of emergency queen cell production, the number of open queen cells in which larvae are being reared is a measure of the deficit in queen substance, as there is evidence that the workers are able to obtain some of this substance from such cells.

Unfortunately we do not yet know for certain what queen substance is. It appears possible, however, that it may be part of the waxy substance with which a queen's body is covered. At all events, it is soluble in a number of organic solvents, such as ethyl alcohol and acetone, as potent extracts of it have been obtained in these substances.

At least one of the ways in which queen substance is transmitted from the queen to her workers is known. If a laying queen is watched in an observation hive it will be seen that some of the young, household bees which form a group around her from time to time lick her body. (The same is true of virgin queens but is more difficult to observe.) Observations were, therefore, made (Butler 1954) on the actions of twenty bees in turn, each of whom were seen to lick her queen, and also on the actions of another twenty bees who examined her with their antennae but did not lick her. Each of these forty bees was watched continuously for five minutes immediately she had left her queen, and it was found that every one of the bees who had licked her body offered regurgitated food to at least one other member of her colony during this period, and that most of them gave food to several bees in succession. On the other hand none of the bees who merely examined the queen with their antennae offered food to any other bee within five minutes of leaving her queen.

It was considered probable, therefore, that some of the members of a colony obtained queen substance directly from their queen by licking her body and subsequently shared it with other members of their colony in homeopathic amounts in regurgitated food. The continuous movement and food exchange that occurs in every colony appears to be fully adequate to ensure thorough mixing of the household members of a colony in a short time and the sharing out of sufficient queen substance. In order to test this point, however, a series of experiments was carried out. Groups of queenless workers in cages were fed on a protein-rich diet to which the honey-stomach contents of other worker bees who had just been licking the bodies of their queens were added. It was found that ovary development in these experimental bees was significantly less than that in queenless control bees, kept in the same way, and fed on the same diet, except that the honey-stomach contents which were added were obtained from bees which had not been near a queen for several days.

Although the existence of queen substance and the end result of feeding it to worker bees have now been adequately demonstrated by various workers, it should be realized that we still do not know for certain whether this substance acts directly upon the metabolism of a worker, or whether it merely serves as a "trigger" mechanism which results in the release within the body of each recipient bee of some other substance, probably a hormone, which is the actual inhibitor both of ovary development and of the urge to rear a new queen. If it does prove to be only a releasing mechan-

ism there is always the possibility that other, at present undiscovered, releasing mechanisms—possibly even psychological ones—also exist. Whether this is so or not there seems no doubt that queen substance plays a predominant role in the maintenance of the cohesion and social organization that is so characteristic of honey-bee communities, and clearly a knowledge of its function is likely to be of benefit to practical beekeepers in several ways.

Worker honey bees can, of course, very quickly distinguish between virgin and mated, laying queens. Since they can do this even in the case of queens that are deeply anaesthetized, this ability cannot be dependent upon differences in the behaviour of these two types of queens, but rather, appears to be due to differences in the qualities of the queen substances produced. In this connection the experiment described earlier in which worker bees from colonies headed by mated, laying queens were contaminated with virgin queen substance and subsequently attacked by their sisters when returned to them, whereas control bees which had been in contact with strange mated, laying queens were not, will be remembered.

As it appears that a household bee's desire for queen substance is very strong, it is likely to be a factor which should be taken into account in practical beekeeping, particularly perhaps in such matters as queen rearing and queen introduction. In this latter connection the result of recent work on the behaviour of worker bees towards intruding bees —both workers and queens—from other colonies (Butler and Free 1952) strongly suggest that the behaviour of the members of the recipient colony must be taken into account as well.

Finally, perhaps I may be allowed to make the following tentative suggestions of the principles which should be taken into account when attempting to develop really efficient and economical methods of queen introducing.

(a) The colony to be requeened should not be left queenless for more than a few minutes. The new queen should be introduced directly the old queen has been removed. Data have been collected (which it is hoped to publish shortly) which indicate that within limits the longer the intervals between removal of the old queen and substitution of the new one, the greater the chance of failure. In other words the bees should not be allowed to suffer even temporarily from a deficiency of queen substance.

(b) The new queen should be introduced quickly and alone, that is to say without attendants. If attendants are introduced with her their strange body odours tend to alert the bees of the recipient colony and this may lead to difficulties.

(c) Generally speaking, I consider that it is wise to introduce the queen in a cage. This cage should be so designed that the queen is automatically released from it within a few hours without the necessity of further intervention on the part of the beekeeper, which would inevitably cause some further disturbance.

(d) The mesh of the wire-gauze from which any introducing cage is made must be large enough for the worker bees of the recipient colony to be able both to feed and to lick the queen. The larger the meshes, provided only that the workers cannot pass through them, the better. Many cages—especially mailing cages—used for queen introduction today are made with wire-gauze of much too fine mesh, with the result that the recipient bees cannot obtain anything from the queen.

(e) The queen should not be provided with food in the cage. The proper food for a mated queen is brood-food and, given the chance, the recipient bees will provide this and thus be brought into contact with the new queen.

(f) The cage should be placed amongst those bees which not only produce the most brood-food but which appear to require queen substance most. These are the nurse bees and, as they congregate together in the brood-area of the hive, the cage should be placed in this area, whenever possible between two combs containing young larvae.

(g) The partial and temporary reduction in the quantity of queen substance that the bees can obtain from the queen whilst she is still in a cage may lead to the formation of a few emergency queen cells. That is to say to a condition similar to that which occurs immediately prior to queen supersedure. Such emergency queen cells may, in our experience, be safely ignored provided that the queen is released from her cage within twenty-four hours of introduction, as the bees tear them down again a day or two after the queen has been released and, presumably, the amount of queen substance in circulation has reached a certain level.

The cage which we have used experimentally during the last two seasons is simply a cylinder of wire-gauze, about three inches long and half an inch in diameter, one end of which is blocked with a wooden plug. The queen is placed in the cage without attendants or food, and the open end is covered with a single thickness of newspaper held in place with a rubber band. The cage containing the queen is then sandwiched between two combs of young brood and the hive closed down.

I hasten to add that I do not suggest that this is a new type of cage, or a new method of queen introduction. Furthermore, although it has now been used on a fairly large scale, and by a number of beekeepers, with a promising degree of success, the method should still be regarded as experimental.

In conclusion it can be said that although it is true that the concept of queen substance has thrown light on a number of important and hitherto inadequately explained aspects of bee behaviour, the application of this information to the problems of practical beekeeping still very largely remains to be worked out.

Literature Cited

Bier, K. von. 1954. Ueber die Einfluss der Königin auf die Arbeiterinnen-Fertilität im Ameisenstaat. Bull. Un. int. Etud. Insectes sociaux **1**: 7-19.

Butler, C. G. 1954. The method and importance of the recognition by a colony of honeybees **(A. mellifera)** of the presence of its queen. Trans. R. ent. Soc. Lond. **106**, Part 2: 11-29.

Butler, C. G. and Free, J. B. 1952. The behaviour of worker honeybees at the hive entrance. Behaviour **4** (4): 262-292.

Free, J. B. and Butler, C. G. 1955. An analysis of the factors involved in the formation of a cluster of honeybees **(Apis mellifera).** Behaviour **7** (4): 305-316.

Groot, A. P. de and Voogd, S. 1954. On the ovary development in queenless worker bees **(Apis mellifica L.)** Experientia **10**: 384.

Hess, G. 1942. Ueber den Einfluss der Weiselliäsigkeit und des Fruchtbarkeitsvitamins E auf die Ovarien der Bienenarbeiterin. Beih. Schweiz. Bienenztg. **1**: 33-109.

Lecomte, J. 1950. Sur le determinisme de la formation de la grappe chez les abeilles. Z. vergl. Physiol. **32**: 499-506.

Lecomte, J. 1951. Les facteurs de l'agressivité chez l'Abeille. C. R. Acad. Sci. **233**: 1376.

Maurizio, A. 1954. Pollenernährung und Lebensvorgänge bei der Honigbiene **(Apis mellifica L.)** Landw. Jb. Schweiz. **68**: 115-182.

Pain, J. 1954. Influence of dead queens on the ovarian development of worker bees **(Apis mellifica).** Resume No. 27. XV Internat. Beekeeping Cong., Copenhagen.

Perepelova, L. 1929. Laying workers, the ovipositing of the queen, and swarming. Bee World **10**: 69-71. (Transl. from Opitnaia Pasieka, May-June, 1929.

Handling The Honey Crop For Small Beekeepers*

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Assistant Entomologist, South Carolina Experiment Station

Provide Necessary Place and Equipment

THE place for extracting the honey should be selected before it is removed from the hives. The bee-tight room should be at least 14 x 20 feet or even better 300 square feet. A basement room with a concrete floor is suggested. This room should be equipped with an extractor, ample storage facilities (60 pound cans and a tank with a honey gate near the bottom for bottling), electric lights, hot and cold water, a large sink, a table (5 x 8 ft. x 20 in. high) built from 2-inch thick material on which to mount the extractor and storage tanks, and a trough with two sections for uncapping and cutting comb honey. This box or trough (figure 1) should have a slanting bottom made of aluminum with a hole in the lower end for catching honey drainings from cappings. The top section of this box should have a hardware cloth bottom to catch the cappings and particles of comb and to allow the honey to drain onto the aluminum bottom. Other equipment needed includes an uncapping knife, strainer, sharp thin-bladed knife, a hive tool, some narrow tables for stacking empty honey jars and filled cases, a funnel for a bee escape through a window, a large boiler for heating honey and two queen excluders (3 wire is good). If a honey house is to be built it should be high enough at one end to be of the same level as a truck body. Having the floor on two elevations would also be an advantage.

Removing Honey From Hive

Equipment needed: Smoker, veil, hive tool, carbolic acid, acid board, truck, a sack of pine needles for fuel and some dry matches. An ideal time of day for removing honey is around noon on a fair warm day. At this time of day there are fewer bees in the hive, the bees are more gentle, and the acid board is most effective. (The acid board can be made by covering the rim of an inner cover with a canvas cloth and moistening with carbolic acid.)

When everything is in readiness and you are ready to take the honey you should first get the smoker going full blast. Sprinkle the acid cloths until moist. Now remove the top cover and give two or three good puffs of smoke into the hive and immediately place an acid cloth over the hive. If there are several hives another acid cloth should be available and placed on the second hive while the bees are leaving the

* S. C. Experiment Station. Z&E Department Mimeo. Series No. 13. Prepared December 1954 - Revised for publication May 1955.

Fig. 1—Box or trough for catching honey drainings.

Fig. 2—Uncapping honey.

first super. In case the yard has 30 or more colonies you can profit by using a third or fourth acid cloth. If the temperature is in the 80's or above, most of the bees will be off the honey within 5 to 7 minutes. Care should be taken not to allow the bees to be driven out of the hive. Honey can be taken by smoking the bees down and it works very well if only a few colonies are to be worked. The supers can be practically freed of bees by using plenty of smoke and a brush.

Any unfinished frames may be concentrated and placed on good colonies of bees. Remove only honey from the yard that is suitable to market. If a good honeyflow is still coming in it is wise to have some supers of foundation along and replace any frames of honey removed from partially filled or filled supers.

The chunk-comb honey and honey for extracting should be separated as it is removed from the hives and so marked. Load the honey on the truck as it is removed from the hives and keep it covered with a canvas if there is any indication robbing might occur. When the honey is carried into the packing plant and is not packed within a period of 10 days it should be stacked as straight as possible to aid in fumigation. The comb honey to be cut should receive special attention as it must be clean, white and free of pollen. It must also stay in storage until the other honey is extracted and settled, which requires several days giving the wax moth a chance to get started. This honey should be fumigated with carbon disulphide.

Extracting the Honey from Combs

The labor factor in extracting honey is not strenuous but requires some know-how and speed. Three people make a well balanced team to operate a 4-frame extractor. One can do the uncapping, one the extracting, and the other can keep the supers of honey ready for the fellow who is doing the uncapping. He can also handle the frames after the honey is removed and take the honey from the extractor (without permitting the honey to spill).

The person doing the uncapping (fig. 2) should take precaution not to mash the cells. The uncapping knife should be sharp and the operator should hold the knife at an angle so as to carve the caps off the combs rather than mash them off. The caps should be cut as thin as possible to get the larger amount of honey from the frames into the extractor.

The operator of the extractor (fig. 3) should take care that the extractor is clean. He should not turn the extractor too fast nor stop too suddenly as this could break the tender combs and render them unfit for use again. The combs should, however, be fairly clean of honey.

Running the honey from the extractor into 60-pound cans works very well. These cans do not color the honey. The honey should remain in these cans until ready to bottle (5 to 10 days at least). Three people should work at least 10 supers per hour.

Packing Honey

One of the first jobs in packing honey is to clean and label the jars. Dirty jars should be washed in clean, warm, soapy water, rinsed and dried before using.

When the extracted honey has settled (all foam on top) it is ready to bottle. Warm the cans in warm water baths to aid in straining and bottling. Strain the honey through four thicknesses of cheesecloth or use nylon hose. Take care not to get the honey over 140 degrees F. Sieves used for straining lubricating oil may be used for straining honey. If prevention of granulation is de-

(Please turn the page)

Fig. 3—Operating the extractor.

Fig. 4—Filling the jars with extracted honey.

sired bring the temperature up to 140 degrees F.

The cut-comb honey should be cut with a warm, thin-bladed, sharp knife using a queen excluder as a foundation over the uncapping box. The pieces of comb should be cut in a systematic way to make every jar a similar finished pack. The popular 2½-pound wide-mouthed square jar (fig. 4) is very easy to pack with comb honey. The more common practice in making this pack is to use two pieces the width and length of the jar and two pieces to brace them into position against the sides of the jar. The standard 4½-inch shallow frame of honey is the proper height for cutting to fill the 2½ pound jar. By using ten frames in the 10-frame standard supers the tiers of honey are thinner than when using 9 frames and easier to pack. There is a common practice in some sections to pack only a small piece of comb in the jars. The comb pack should run approximately 40 per cent comb honey. The pieces of comb should extend well down to the bottom of the jar.

Filling the jars with extracted honey over the comb honey (fig. 4) is a tedious job, especially if the extracted honey is cold. The jar should not be filled brimming full of extraced honey as the honey will expand when it gets warm and run out. Filling the jar to the bottom of the neck is sufficient.

For packing extracted honey the 1-pound jar is very popular. It is a good practice to pack all the dark honey in small, thin containers as this will tend to make the honey look lighter in color.

Only honey of good quality, flavor, and color should be packed for table use. Poor grades of honey on the grocery shelf will cause poor sales and be a stumbling block to the sale of good honey.

Marketing Honey

Good substantial honey markets must be established in order to sell honey in an orderly way. One of the mistakes that many beekeepers make is selling all the honey crop as soon as it is ready for the market. This is not orderly marketing, and often is the cause of honey being sold at below cost prices. The beekeeper should establish a few good customers and keep them supplied 12 months in the year. It is better to get out and buy some honey for your retailer than to run out of honey and lose his business. Honey makes an excellent gift and many furniture store dealers and insurance men would be glad to buy some honey to hand out to their customers if they were contacted on the matter.

Although we have no figures to prove the fact, honey packed with chunk comb should wholesale at 30 cents per pound and retail for 40 cents per pound in order for the producer to make a profit.

If a groceryman has trouble selling your honey take it up and place it where honey is in demand. See that the jars are kept clean and displayed where they can be seen.

Promoting Honey —

(Continued from page 271)

of the country. Beekeepers located in every section are in key positions to do the actual job of promotion. Your location, your knowledge, and your direct personal interest—all of these make you the best possible promoters for honey.

Cattlemen have set up their own state and national associations. Millions of dollars in advertising programs have been spent. Still, they find that to do the best possible job there is nothing like the personal contact and "shoe leather" work by state and local groups—particularly their women's auxiliaries. These colorfully call themselves the "Cowbelles"—and they've done an outstanding job of promoting beef. The dairy industry is doing the same thing. They all recognize that the real job is to be done at the local level.

Some of you are doing an outstanding job at the state and local level. But we've noted—as I am sure you have—the good-natured complaints of some of you local men who've been doing aggressive promotion. You complain that you enjoy very little cooperation from many of your fellow beekeepers. And we've noted, too, the slowness with which industry funds for research and promotion seem to accumulate.

These are common symptoms of the growing pains that are often felt by organizations of producers of agricultural products. They indicate that you have reached the stage where you must decide whether you want to support a good promotion program—or to try to sneak by with none at all. If you have one, it must be a good program.

How will you support your program? There are two basic ways: to do it all yourself, or to raise the money to hire a professional promotion organization to do it for you. There are all sorts of compromises between these extremes.

To do it yourself is the most economical way. You get maximum return for every dollar you spend. Hiring a promotional expert is definitely not the most economical way. If you're able to spend only a little money in hiring help, remember that money talks in this business, and only a little money is practically speechless.

There are many in-between areas and your honey industry has special advantages that recommend this course. You have interested beekeepers in every area, available for local effort. You have a potent force in the American Honey Institute with National Honey Week established as a recognized event—a time when you all can really concentrate on your promotion effort. Spending money on promotion is fine but don't ever forget that results also depend on what you do yourself at the state and local level.

If I've seemed to raise more questions than I've answered, that's what I intended to do. You beekeepers have arrived at the stage where you must chart the course ahead. Stability and expansion in honey markets can come only when there is an aggressive, continuing demand and a dependable quality supply to match it.

We in the Department of Agriculture will always be strongly behind you. We can actually participate in your promotion program only when honey meets our standards as a plentiful food. But remember that we are always available for any help that we can give with respect to suggestions or in any other way. We're interested in the honey situation and we want to work with you just as closely as we can—to give you the full benefits of all our marketing services.

A New Approach —

(Continued from page 274)

of foundation to be used for each section. Nine frames, each containing four sections, are used to the comb honey super. The Killion super was chosen because of its excellent ventilation and its size, ample to hold the thirty-six round sections. Any standard comb honey super may be converted to the plastic frames by a simple end board and metal strip at each end. This provides the ven-

tilation and beeways of the Killion super. A frame may be made to carry two of the Styron frames to hang in a standard hive body making a double comb honey super.

The ready acceptance of the plastic by the bees is easily understood when one understands the thermal properties of Styron. This material has an even lower heat conductivity than basswood and, therefore, does not feel cold to the bees as they crawl over it. The other advantages are extreme ease of assembly of half sections to the frame halves, dropping the foundation in place and pushing the two halves together. The foundation sticks them together and they drop into the super just about as quickly as you can read this. Actual time to assemble nine frames and load into super is approximately 15-20 minutes by the average operator. The extreme accuracy of the die-made plastic parts leaves no cracks between the sections and the frames for the deposit of propolis. The frames fit against each other without cracks other than the accurate beeways.

Fewer supers are necessary as there is no clean-up required on the plastic sections and a super of filled sections may be unloaded and reloaded with fresh sections in less then 20 minutes.

The increase in honey yield per hive due to the ready acceptance of the smooth plastic by the bees seems to be about 30%.

The section produces a beautiful package when a plastic, specially designed cover is snapped on each side and the edges are bound with a label. The net weight of the honey is a full 8 ounces.

The first cost of the frames is more than wood frames and separators, but inasmuch as they do not have to be cleaned, their life is many times greater than wood. Moisture or mildew has no effect on plastic frames. In fact, there is no reason to ever replace them. The cost of the sections is competitive with that of a split wood section as they are ready to use and do not have to be folded with the usual two to five per cent loss. The attractiveness of the transparent covered package makes for very low resistance by the housewife to one of the most beautiful products of nature, comb honey.

Beekeeping in Peru

by E. J. Dyce

Part I

DURING a recent sabbatical leave it was my privilege to work three months in Peru making a survey of the beekeeping industry and its problems.

Peru is slightly larger than the combined areas of Arizona, California, Nevada and Utah. Its coastline, which forms the western bulge of South America, is over 1400 miles long. The country is roughly divided into three longitudinal areas, the coast, the Andes mountains, and the tropical slopes and jungle lying east of the Andes.

Over 90 per cent of the low coastal area is desert interspersed with many fertile valleys which are irrigated from streams flowing from the Andes to the Pacific ocean. In this area of hot, dry sand it rarely rains, but the cool Humboldt ocean current flowing from the Antarctic constantly bathes the entire coast and moderates the temperature.

The Andes consist of great ranges of lofty mountains with irregular fertile plateaus and valleys lying between them. The climate in this area varies with altitude but most of it is quite cool during the rainy season which lasts from October to April.

The eastern tropical lowlands and especially the jungle has a great deal of rain and is hot, humid and densely forested. This area is largely undeveloped and partially unexplored. It occupies more than 60 per cent of the entire country.

Peru does not have a full time apiculturist and the beekeepers have not until recently had the benefit of being advised and encouraged to use modern equipment and methods. Since there was little information on the extent and problems of the beekeeping industry of Peru, it was necessary for me to do more traveling and pioneer work than expected

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Many people keep a few colonies of bees in cities, towns and villages. This small apiary in the heart of Tara, a town in the mountains is typical of many throughout Peru.

An apiary near Mejorada in the mountains which was short of food and not well managed. With proper care the production of these colonies could have been doubled.

before an accurate picture of the industry and its needs could be obtained and evaluated.

From all the information secured it is doubtful if there are more than 4,000 beekeepers in Peru operating about 25,000 colonies. Most of the beekeepers have less than 20 colonies but a few operate between 100 and 500 colonies. Over 80 per cent of the colonies are housed in home-made equipment, most of it varying slightly in size from the standard 10-frame Langstroth hive. A large percentage of the hives contain cross-comb and considerable drone comb. The average annual production of honey per colony rarely exceeds 20 pounds but a few skilled beekeepers in favorable locations have been averaging about 80 pounds per colony during recent years.

Over 65 per cent of the colonies are located on the plateaus and valleys in the Andes Mountains between Huancayo and Arequipa in the southern half of the country. Most of the honey in this area is obtained from alfalfa and eucalyptus. About 25 per cent of the colonies are located in the irrigated valleys along the coast. Most of the nectar in this area is gathered from cotton, alfalfa and mesquite. The relatively few colonies scattered along the lower eastern slopes of the Andes gather nectar from such sources as coca, coffee, cacao, citrus and bananas.

Little is known about the possibilities of beekeeping in the tropical lowlands and jungle on the far eastern slopes of the Andes. The higher areas of the jungle such as the plateau surrounding Tarapota might be favorable for beekeeping. So far it is not possible to enter this and some of the other promising areas except by plane. It is very costly to build roads through the mountains and it may be years before good highways connect these new areas.

Little difficulty has been experienced in marketing all the honey and beeswax produced in Peru. Both products are readily utilized within the country. With a little promotion Lima alone should be able to absorb all the honey and beeswax produced in Peru during the next few years.

Alfalfa is one of the major forage and seed producing crops in Peru. Most of the alfalfa seed which is planted in the coastal areas of both Peru and Chile is produced along the northern coast of Peru chiefly between Chiclayo and Trujillo. On the other hand most of the alfalfa seed planted in the mountains of Peru and Chile is produced at high altitudes in the mountains of Peru around Pallasca, Huaylas and Arequipa. For years it has been realized by the native Peruvians that the seed produced on the coast does not do well on the mountains and the seed produced on the mountains does not grow well on the coast. For this reason the two types of seed have been kept strictly separate.

There has been a definite shortage of bees in the major seed producing areas of Peru and plans are now underway to correct this situation. It was interesting to learn that the agronomists have been recommending for several years that alfalfa should not be cut for hay until at least 10 per cent of the plants are in bloom. This plan, it is claimed, reduces the possibilities of bloating in livestock. At the same time it provides more nectar for the bees.

(To be continued in August)

Honey and Your Diabetes No. 4

by D. C. Jarvis, M.D.

VERMONT is second among the states in the nation in the percentage of its population over 65. At present Vermont has 40,000 persons over 65 years of age. Each year nearly 2500 individuals reach the age of 65. As the years of medical practice passed, I realized that native Vermonters could be divided into two classes. One class lived close to the soil and followed nature's plan. The other class did not live close to the soil and constantly tried to rearrange nature's plan according to their own desires. Those who lived close to the soil and accepted and followed nature's well worked out plan came to the latter years of life with good eyesight, good hearing, good mental vigor and good physical vigor. Those who did not live close to the soil and were constantly trying to rearrange nature's plan came to the latter years of life with a damaged human machine. Their eyesight suffered varying degrees of impairment. Their hearing became impaired to varying degrees. Their mental vigor declined and their loss of physical vigor was quite evident. I began to seriously study these aged native Vermonters who lived close to the soil thinking that in doing so I might learn medicine not written in books that would help me to render better service to my patients. I asked them what nutritional pathway one should follow in order to come to the end of life with good eyesight, good hearing, good mental vigor and good physical vigor. What I learned is helpful to an individual with diabetes mellitus who is trying with the aid of his physician to work out a daily food intake that will prove satisfactory.

These aged Vermonters who lived close to the soil and followed nature's plan told me the first thing I must do was avoid eating wheat foods such as bread, cake, cookies, doughnuts, etc. and wheat cereals. I asked why I should avoid wheat foods. I was told this advice was handed down by one generation to the succeeding generation and was confirmed by studying animals and fowl. I was told that birds, hens and chickens will not eat wheat. If a scratch feed containing wheat is thrown on the ground they will not eat the wheat part of the scratch feed. Later, if they are hungry and there is nothing else to eat, they will eat the wheat that remained. Their preference is corn. When cracked corn is thrown on the ground they will forsake other food and at once turn to the corn. I was told this fact was evidence that our bread should be corn bread and our cereal cornmeal mush if they both agreed with us. A great deal was said about popcorn as a food. I learned from my friends who feed birds during the winter months that if a prepared food for wild bird feeding contains wheat the birds will separate out the wheat and not eat it. In order that I might check this I fed pigeons for two months in order to learn what they would eat. They would not eat wheat. Any time I threw down cracked corn they would forsake other food and turn at once to the cracked corn. From this I judged these aged Vermonters who lived close to the soil were correct in their observations. I asked what happened when hens did eat wheat. I was told they will have weak offspring and will lay soft-shelled eggs.

I was also told that if a dairy cow continued to eat a ration containing much wheat she would give birth to a weak, undersized calf born two to four weeks too soon. I asked what happened when a human individual ate wheat foods each day. I was told such an individual tired easily, there was less mental and physical endurance, a burning sensation in the stomach was often present after eating, gas was belched from the stomach, constipation was generally present and also a dry skin.

Why should this knowledge relating to wheat foods be of value to an individual with diabetes mellitus? Wheat foods organize the human body on a combat basis which means the suffusing of the blood with sugar. Wheat stimulates the body mechanism that enables us to fight or run. On the other hand corn foods help the body to organize on a peacetime basis with the result that the sugar in the blood is converted into glycogen which allows it to be stored in the body against the day of need. Corn is a sedative to the body.

According to what I learned from many aged Vermonters who lived close to the soil the individual with diabetes mellitus should try exchanging wheat foods for those made from rye flour or corn meal and note the effect on the sugar content of the urine and whether a marked improvement in the way one feels does not take place.

Kelley's New Book . . .

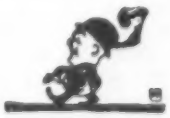
Walter T. Kelley, editor of "Modern Beekeeping" is author of a beginner's book entitled "How to Keep Bees and Sell Honey." This 110-page volume is paperbound and contains 185 illustrations. It presents a well-organized description of all phases of beekeeping from when, why and how to begin, through selection of equipment, and into manipulation in the apiary.

The latter half of the book chiefly pertains to harvesting the crop, preparing it for market, and marketing and selling helps. There are also chapters on swarming and transferring of bees, with short sections on requeening, outyard management and diseases.

This volume sells for 75c and may be obtained directly from the author at Clarkson, Kentucky or from the American Bee Journal.

A. V. Mitchener Appointed Professor Emeritus

A. V. Mitchener, University of Manitoba, is now Professor Emeritus in Entomology, effective in Sept., 1954. His influence on beekeeping in the Province has been considerable. His beekeeping schools led the beginner to start right and kept the experienced well informed. His research work and his field work held Manitoba in the front rank in the beekeeping field. He was born in 1888 at Clear Creek, Ontario, in a farm family; which was largely responsible for his long interest in rural affairs. He taught school during his entire period of service, finally becoming Professor of Entomology at the University and Dean of the Faculty of Agriculture and Home Economics. A list of his publications in entomology covers five long pages. We wish him a long term of happiness in retirement.



ABIE STINGS SEZ:

Well, the honey flow's about over now, and like most fellers, I'll go out, count the supers, and start braggin' about my crop. Seems like I never learn that there's a good many pounds of difference 'tween the wood and the liquid honey.

You Asked for It...

Elmer Luebeck, Illinois

What can be done to prevent bees from visiting the neighbors who grind feed for their cattle?

It is characteristic of bees to visit the places where feed is ground. The scent attracts them, as feed resembles pollen. Bees may carry fine flour to their hive. Open bins of bran will attract bees and they will visit these bins when they can get to them. There is little that can be done to prevent it if the bins are open and accessible.

J. A. Swingle, New York

How can I kill the bees in some weak colonies and take the honey?

Wait until a cold day, brush the bees off the combs onto the ground and they will become paralyzed with cold and die. Then the honey can be taken off. Gases used to kill the bees in the hive are dangerous to use and may disflavor the honey. If you have two or more weak colonies they may be united to make one colony, giving them some stores and taking the rest of the honey. This may be done by setting one colony on top of the other with a sheet of newspaper between. The bees will gnaw through the paper and unite and the better queen will survive. Another quick way is to kill the poorest queen and place most of the brood of both colonies in one hive with the remaining queen and part of the bees. Then shake all remaining bees from both colonies in front of the hive, sprinkling them with sugar sirup and smoking the entrance. In late fall, colonies often may be united by merely placing them together. Be sure they have ample stores for winter.

Marion Frasher, Delaware

How can colonies that have built up late in the fall, or suffered from drouth be boosted?

Last year the drouth was hard on bees everywhere. Giving frames of sealed brood is a good way to boost them as long as you know that all of your colonies are clean of disease. If a colony has foulbrood, mixing brood is a good way to spread disease. Colonies may also be boosted by uniting weak ones, or by feeding either in the spring or fall. An early spring check and feeding may often save colonies that otherwise might not survive.

MEETINGS

Federation Honey Display Picture Contest

In order to stimulate interest in the Federation's Honey Promotion and to publicize proper displays which sell honey, the Federation, with the cooperation of Gleanings in Bee Culture and the American Bee Journal, is conducting a Honey Display Picture Contest.

All beekeepers, members of their families and hobbyist beekeepers are welcome to enter. Prizes will consist of suitable beekeeping supplies. Winners will be published in the above mentioned journals. Complete rules and detailed information will be published in the August issues. Send all entries to Robert Banker, Sec.-Treas. American Beekeeping Federation, Inc., Cannon Falls, Minnesota. (No entries returned.) Contest closes September 1, 1955.

Essex County (New Jersey) Report and Meeting July 9

The Essex County Beekeepers' Society held their first outdoor meeting for 1955 in the beautifully landscaped apiary of Mr. and Mrs. William Gardner, at Nutley. In spite of inclement weather a record number of members were present for a most informative and amiable afternoon. Manuel Calvache of North Caldwell was the guest speaker on the timely topic of "Honeyflow Management." A highlight of the meeting was the suggestion by Paul Grierson and John Butterworth to have the Society act as a body in handling the numerous bee-removal requests resulting during the swarming season. Mrs. Elizabeth Panagini suggested that grateful callers send correspondence of appreciation or donations to the Society to create a fund to supply those beekeepers who help out in this service with additional equipment to continue in their aid. The next outdoor meeting will be in the attractive apiary of President H. Russel Corwin in North Caldwell, Saturday, July 9, at 2 p. m.

Louis M. Panagini,
Executive Secretary

Iowa Summer Meeting, Stratford, July 9

The annual summer meeting for beekeepers, sponsored by the Iowa Beekeepers Association, will be held through the courtesy of Mr. and Mrs. Carl Soder at their new honey house one mile south of Stratford, Iowa, on Saturday, July 9. The program will open at 10:00 a. m. with games and contests, and there will be a short speaking program in the afternoon followed by an apiary demonstration and special demonstration on queen rearing by Mr. Soder. A local organization will make available items for lunch at a nominal cost. Picnic baskets are in order for those who prefer them.

F. B. Paddock, Extension Apiarist

Middlesex County, (Mass.) July 9, 16, 24, and 30

This will be a busy month. Saturday, July 9, members are invited to visit the summer home and apiaries of Mr. and Mrs. Robert Cheney, York, Maine. Saturday, July 16, we have an invitation from the Worcester County Association to attend their annual field day at the Wallace Parker apiary, West Boylston. July 24, Mr. and Mrs. William Austin, invite us to visit them at their summer home on Monument Beach, Cape Cod. Saturday, July 30, the regular meeting of the Association will be held at the home of Mr. and Mrs. Chester McInnes, 521 Marrett Road, Lexington.

L. C. Proctor, Sec.

New Jersey "Week of Bees" July 10-16

The New Jersey Beekeepers' Association has designated the week of July 10 as "Week of Bees." The program begins on July 11, which is registration and beginning of the Beginners' Short Course in Beekeeping to be held at the Log Cabin, Experiment Station, New Brunswick, N. J. July 14 and 15 will be devoted to the Advanced Short Course in Beekeeping, which this year will cover queen rearing and foraging habits of bees.

Saturday, July 16, is the annual summer meeting at the Log Cabin in New Brunswick, N. J., with speakers of national prominence listed. For program, write New Jersey Beekeepers Association, Annandale, New Jersey.

Midwestern Association, July 10, Unity Farms, Lee's Summit, Missouri

The monthly meeting of the Midwestern (Missouri) Association will be on July 10, at "Apple House," Unity Farms, Lee's Summit. Also the annual picnic will be at Swope Park, Kansas City on Aug. 14. Enjoy a basket dinner, take part in the contests and go home with prizes

A. W. Mogers, Pres.
Mrs. Wm. Brite, Sec.

Federation Executive Meeting, Denver, July 14-15

The Executive Committee of the Federation will meet in Denver, Colorado, at the Auditorium Hotel on July 14 and 15 to consider any and all business which may properly come before it.

Any state or local association wishing to present an invitation to the Federation for its 1957 convention should have it in the Secretary's office not later than July 5.

The site of the 1957 Convention will be selected at that meeting to assure accommodations in the city selected.

Northwestern Pennsylvania, Canadohta Lake, July 27

The Northwestern Pennsylvania Association will meet at Canadohta Lake, July 27. A basket dinner is planned, followed by games and speakers. Plenty of entertainment for the children. Everyone invited.

Mrs. Zona Spring, Sec.

Ohio State Meeting, July 16, North Nimisillen School

This meeting at the school is at the intersection of State Routes 44 and 62, north of Louisville, Ohio, and in the vicinity of Canton. Host: Stark County Association. Door prizes; meals on grounds.

Program — Harry J. Vandenberg, Secretary of Ohio State Asso., "European Experiences"; Walter Barth, Gleanings in Bee Culture, Medina, "Honey Marketing"; Geo. Rehman, North Baltimore, "Comb Honey Packed in Glass"; Charles A. Reese, Extension Specialist, "The Smaller Beekeeper's Biggest Problem"; S. E. Bailey, State Apiarist,

"Inspection Report"; Alan I. Root, Medina, "The Beekeepers Problems from a National Aspect"; plus a panel discussion, introduction of candidates for regional contests for Ohio's Second Honey Queen. Banquet.

Westchester County
Port Chester, N. Y., July 17

The Westchester County Beekeepers Assoc. will hold its next regular meeting on Sunday, July 17 at 2:30 P.M. at the home of Mr. and Mrs. Alfred Roth, 146 Oak Street, Port Chester, N. Y.

An interesting program is planned for the afternoon. There will be inspection of hives and a demonstration will be given by Mr. Roth on extracting honey. Bee problems will also be discussed.

An invitation is extended to all beekeepers and their friends. A pleasant afternoon is in store for all those who attend. Refreshments will be served.

Mrs. Alfred Roth, Publicity

Illinois Summer Meeting,
Fernwood Park, July 24

The Cook DuPage Association is sponsoring the Illinois State Summer Meeting, Sunday, July 24, at Fernwood Park, 104th St. and Wallace Ave., Chicago. Program—Carl E. Killion Chief Inspector, Illinois, "Package Bees vs. Over Wintered Colonies"; Harriet M. Grace, American Honey Institute, Madison, Wis., "The American Honey Institute"; Dr. Walter Rothenbuhler, Iowa State College, "Our Future Queen"; Dr. V. G. Milum, University of Illinois, "My Experience with Antibiotics"; M. G. Dadant, American Bee Journal, Hamilton, Ill., "Royal Jelly." There will be a panel discussion for questions and talks for the hobby beekeeper.

Southern Wisconsin District
Watertown, July 24

Beekeeping Associations representing the Southern Wisconsin District (Columbia, Dane, Green, Iowa, Jefferson, Lafayette, Rock and Walworth counties) will have a combined picnic and summer meeting on Sunday, July 24, at the Girl Scout Area in Riverside Park, Watertown, Wis. Beekeepers, their friends and any other persons interested in beekeeping activities are cordially invited.

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Late Summer

by David A. King

THE weather during the Spring had been chilly. Now suddenly it turned hot—hot and dry. The water supply dried up so we were without culinary water for the house. Fields without irrigation showed signs of drought.

In spite of the drought there seemed to be blossoms somewhere that the bees were working as one could see almost constant activity at the hive entrance.

As the weather became constantly hotter and hotter, there was more and more tendency for the bees to cluster out. I had made one big mistake in selecting a hive—a mistake which I would never make again. I had bought a "California" model hive which, in my opinion, is a pretty poor hive. The cover is only one single thickness of wood which must be weighted to keep it from blowing off. The bottom board is provided with a ⅜" strip which forms the entrance. This narrow entrance is adequate as long as the colony is weak and the weather is chilly. But when the weather is hot, when there is a honeyflow on and the colony is at its peak strength, the bees need more room to get in and out. I believe the hives with a variable entrance would be well worth the extra cost. A double cover would also give a great deal better protection both from heat and cold than the single thin board which my hive had.

At any rate, for one reason or another, my bees had taken to clustering out. A quick check of their brood chamber failed to reveal queen cells so they were not intending to swarm. I checked my books. According to them, about the commonest cause of clustering out is lack of ventilation and the next most common is lack of room.

Well, as noted, my hive had a pretty narrow entrance so likely the ventilation could have stood a lot of improvement; and the bees had pretty well drawn all of the foundation in the single shallow super which I had given them. Not only had they done this, but they had built a crooked comb in the vacant space that was left when I removed the two frames from which the foundation had come loose.

I prepared the second of the two shallow supers I had bought by attaching the thin foundation to the frames. I placed this on the hive, purposely moving it about one inch to the rear so as to leave a narrow crack all along the edge where this super joined the one below. I reasoned that this should improve ventilation somewhat. I had read somewhere that this was recommended by many old hands at the game.

The remedy seemed to work as the bees ceased clustering out and settled back to their work.

Things seemed to be going better with this new super than with the first one as the bees took possession promptly and began drawing comb. Evidently I had caught them at the beginning of a honeyflow. The third cutting of alfalfa was coming into bloom at that time so it is quite likely that they were working it and this honeyflow stimulated the rapid drawing of the new comb.

About this time I began having difficulties with other farm operations, difficulties that are not part of this story. These activities diverted my attention from the bees almost entirely.

From time to time I noted casually that they were still working and that they were showing no external signs of swarming. Except for this, they were left alone.

As the weather began to moderate and we had a few chilly nights, I lined the supers exactly so as to close the vent holes I had left earlier in the season. I reasoned that it might be easier for the bees to maintain hive temperature if the upward ventilation was eliminated. This seemed to be the case, as the bees did not cluster out again after I had closed the vents.

Nature reflected the changes in temperature by ripening the late summer fruits and seeds. There must have been some blossoms the bees were working, though, as there was still lots of activity at the hive entrance. Maybe they were carrying in propolis to make their home tight against the winter which they instinctively knew was not very far away.

Brood rearing must have been tapering off as there were far fewer bees taking "play" flights at the hive's front. All in all, it seemed that the colony of bees, in harmony with the rest of nature, was settling gradually toward the winter's sleep.

MEETINGS —

There will be visiting among the beekeepers from 10:00 A.M. to noon, a pot-luck picnic dinner at 12:30 and the general program following.

One of the features of the picnic will be the judging of honey cookery (breads, cakes and cookies) with prizes for the best entries. Any such entries not needed for the picnic will be auctioned off to the highest bidders to help defray the picnic expenses. All the women are urged to participate in this event and to submit their entries to Mr. and Mrs. Marcus Osborne at the picnic area during the morning visiting period.

An interesting exhibit in which all beekeepers are invited to participate will be one in which unusual beekeeping equipment, not normally shown in beekeeping catalogues but originated by the beekeeper and found useful in the apiary or in the honey house, will be displayed. This exhibit will be in charge of Mr. Norman Harper to whom such equipment should be delivered in the morning, properly marked so as to show what the item is used for and the name of the beekeeper who developed it, and his address.

Mr. Art Kehl, of the G. B. Lewis Co., will demonstrate some of the new and unusual products sold by his company and Mr. M. H. Lyons, Loganville, Wis., will lead an open forum discussion on honey sales techniques. There will be special music, games for the children and ice cream and soft drinks for all.

S. J. Otis,
Sec'y-Treas., So. Dist.

Mississippi Annual, State College, Biology Building, July 27

Program: Official reports; honey exhibit in Animal Husbandry building; speakers—address by Charles B. Shuman, President, American Farm Bureau Federation; M. M. Price, State Plant Board, "Apiary Location and Arrangement"; N. C. Jensen, Jensen Apiaries, Macon, "Spring Manipulations"; J. V. Pace, State College, "Swarming"; M. S. Fortune, Stover Apiaries, Mayhew, "When and How to Requeen"; Homer Tate, State College, "Bee Behavior"; Aaron Gonza, State College, "Research on Nosema"; H. B. Green, State College, "Pollination"; J. P. Kislanko, State Plant Board, Wiggins, "Honey Plants of Mississippi"; W. W. Wicht, Wicht Apiaries, Hattiesburg, "The American Beekeeping Federation and the Miss. Beekeepers Association."

Ohio State Meeting, July 30, Blue Ball

The Ohio Association will meet July 30 at the Church Hall, intersection of State Routes 25 and 122, in Blue Ball, near Middletown. Hosts, S. W. Ohio Association. Meals served on the grounds. Program — Walter Thomas, Medina, "Beginners' Problems in Packing and Selling"; S. E. Bailey, State Apiarist, "Inspection Report"; R. D. Oglesby, Middletown, "The Beginner and Comb Honey"; Jack Deyell, Medina, "Tricks of the Trade"; R. L. Livermore, Belle Center, "Bee-in; Not Buzzin' "; Charles A. Reese, Ohio State University, "More about the Beekeeper's Biggest Problem"; Dr. Winston Dunham, London, "Honeyflow Problems"; Emerson Long, St. Paris, "Gleanings from Experience." Introduction of contestants for the Regional Honey Queen.

Kane-DaKalb Association (Illinois), July 31

The Kane DeKalb Association will hold their next meeting Sunday, July 31, at 11 a. m., at the Johnson Mound Forest Preserve, located east of Elburn and route 47; north of Batavia-Kaneville road and near LaFox Road. Hope the early June rains will be over. Anyway leave your boots home as Johnson Mound is one of the highest spots in Illinois. Meet a friendly group of beekeepers and enjoy a pot-luck lunch at 1 p. m. Coffee and ice cream will be served by the Association. Conditions now look very promising for a crop but you can leave your bees for a day. So let's make this a fine meeting.

Ralph O. Klebes, Pres.

Virginia Short Course Blacksburg, August 1-4

The Eighth Annual Beekeeping Short Course, Virginia Polytechnic Institute, Blacksburg, Virginia, August 1, 2, 3 and 4, is being held at the same time as the Garden Lovers' Short Course and registrants may attend sessions of either group that they desire. An opportunity will be available for a picnic on the beautiful Blue Ridge Parkway on Wednesday. This is an excellent opportunity for additional knowledge and a rest from daily routines.

Prof. E. J. Anderson, Pennsylvania State University, will be the guest speaker on apiculture. Paul Cutts, Chipley, Florida, will speak on queen rearing. A combined meeting will be held with the Garden Lovers to hear W. G. Lord, Naturalist, Blue Ridge Parkway, speak on Native Plants.

Space has been secured for rooms in the dormitories at $1.00 per night and meals will be served in the dining hall at 60c each. Registration fee, $2.00. Write J. M. Amos, Blacksburg, Virginia, for details. Anyone interested is invited to attend.

J. M. Amos
Associate Extension Entomologist-Plant Pathologist

American National Honey Show, Illinois State Fair, Aug. 12-20

This was announced in the last issue. It is the first time the National Honey Show has been in Illinois and it will be held in connection with the usual Illinois State Fair bee and honey exhibits, under the leadership of Chief Inspector Carl Killion. A set of rules and regulations covering entries has been prepared and copies may be secured from Carl Killion, Paris, Illinois. This also gives detail of the entry classes.

Beekeeping Short Course Penn State University, Aug. 22-26

A beekeeping short course will be conducted at The Pennsylvania State University from August 22 to August 26, 1955. During this short course, one-half of each day is given to lectures on the theory of beekeeping, the other half is devoted to the practical application of bee management. The course is planned to aid those interested in beekeeping to increase their income, or to render a greater service where pollination is required.

Emphasis will be given to spring management, swarm control, queen rearing, disease control, and the marketing of honey.

Any persons 16 years of age or older and who is interested in beekeeping may attend this short course. For more information or for an application to enroll in the course, write to Director of Short Courses, College of Agriculture, The Pennsylvania State University, University Park, Pa.

Summer Program University of Massachusetts Amherst - August 13

The University of Massachusetts is featuring an interesting and informative program for beekeepers on August 13. The speakers will include Professor George Abrams, Ex-

tension Specialist in Beekeeping, Univ. Maryland; R. B. Willson, President of the R. B. Willson Co. of New York City; Mrs. A. W. Yates of Hartford, Conn.; and Milo Bacon, Chief Inspector of Apiaries, Boston, Mass. The program will be varied and should be very worthwhile. All interested beekeepers are invited to attend.

Palmetto State Association, (South Carolina), Clemson College Week of August 15

The annual summer meeting of the Palmetto State Beekeepers will be held at Clemson College during Farm and Home Week which is the week of August 15. It is likely that we will have our program on Wednesday and Thursday, August 17 and 18. I can give you the definite dates a little bit later when I have had a chance to talk with W. A. Stephen, Extension Beekeeper, N. C. State College, Raleigh, N. C. We usually try to arrange our programs one following the other so that we can take advantage of speakers who have to come from a great distance.

W. C. Johnson,
Extension Entomologist

Southern States Beekeepers' Federation - Asheville, Oct. 10-11-12

A bang-up program is being worked up for this most important meeting. There will be more details available in the August issue. But it is not too early now to mark your calendar so you can be free to attend. One of the features of the program will be a special work shop by specialists in TV and radio to show how to put on a program. They will then actually go to the local station where the program will be broadcast. If you live in a radius of 400 miles of Asheville you are one of 200,000 beekeepers for whom the Federation is planning an all out program for this convention, one that will take care of the commercial man and also the small beekeeper. In October the mountains are the prettiest so this should be your vacation time.

In Memoriam

Era Miller Dadant

We regret to announce the sudden death from a heart condition of Era Miller Dadant, wife of L. C. Dadant, Sunday, June 19, after only 24 hours of illness. She was 76, having been born Feb. 22, 1879.

Louis and Era had celebrated their golden wedding anniversary last September. They were married in Hamilton and had lived their entire married life on the old homestead two miles north to which the Dadants came when they emigrated from France in 1863.

Mrs. Dadant came from a long-lived family and there was little doubt that she would follow in their footsteps and have more than the average life. No doubt, the loss of her son, James, a year ago and of her brother just three weeks ago was a hard blow.

To anyone who had any contact with the L. C. Dadant family, it was hard to assume of more fine and serene circumstances than those under which they lived on the old farm, made into a grand home and surroundings by this fine, kindly and charitable woman and her equally fine husband.

Mrs. Dadant always had a houseful around her, relatives, young and old, helping them to enjoy their waning years, or helping the younger ones to build strength and character; or on summer vacations, or just spending a glorious weekend. And her local friends were equally blessed by her and Louis' hospitality. She was equally busy in various organizations of worth in the surrounding community and with her charitable helps elsewhere.

She is survived by her husband; one daughter, Mrs. Dorothy Irish, of Blandinsville; two grandchildren, Tommy and Susan; one brother, Philip Miller of Boston; one sister, Gladys Provick in California; and a number of nieces and grandnieces, among whom was Mrs. Shirley Miller and husband and four children of Louisville. Shirley had spent most of her formative years with her aunt and uncle, the L. C. Dadants.

Renew Your Subscription

Editorial

Time to Get Express Reduction on Bees?

A recent notice put out by the Railway Express Agency to each customer and prospective customer read as follows:

"This is to inform you that Railway Express now has in effect a lower rating on specified articles of clothing. These reductions range up to 25%.

That carrier's speed and dependability are desirable for this type of merchandise and with this rate reduction applying, it is to our mutual interest to route this order by Railway Express.

We trust the action taken meets your approval."

Is this perhaps any indication of a change in the policy of the Express Company which in the past has driven away business by placing rates so high as to make shipments almost impossible?

This is what has been done with package bee rates boosting them to 1½ times first-class from previous first-class rating.

Most certainly by its former action, the Express Company has not only encouraged but practically forced the buyers in the North and producers and shippers themselves in the South to use their own truck or hired trucks on large quantities of package bees in the South and North movement.

Similarly small lots have gone to a great extent by parcel post. Perhaps the express agency still does not want this business and wants to discourage it but it would not hurt to give them an opportunity to reconsider their previous short sighted policy on express rates on package bee shipments.

Are We Being Outdone?

Have you noticed the large sugar ads appearing in many of the daily newspapers of the country? Have you ever seen an advertisement that size for honey? Isn't it possible our honey could be used to much better advantage than sugar by those people on a reducing diet?

I'm sure every beekeeper knows and feels honey is superior to sugar in many many ways but we don't have the research needed to substantiate our unproven beliefs.

More recently a release from the President of the Sugar Research Foundation appeared in many leading newspapers citing the many new uses being developed by this and other Research institutions for sugar and its by-products. Some of the newer uses listed were detergents which are digestible, bland in taste, etc., plastics, an agricultural adhesive, and a paper plasticizer as well as a new paper, made from bagasse, the material left over when the cane stalks are pressed.

Sure, the sugar industry is big business and the honey industry only peanuts in comparison; but they are organized, with a definite amount of money set aside by each manufacturer or processor for research and advertising according to the volume of business handled, and **they are getting results.**

Further, unless the honey industry gets on the ball with a similar program, even if only on a small scale to start with, the sugar people will take more and more of our customers away.

The honey industry is attempting to launch a fund check-off plan for funds for Research and Promotion with 1c a can to be deducted from the producer and an additional 1c per can to be paid by the Packer. The Federation heartily endorses this plan and urgently requests you to participate in it whether you are a producer or packer. Most producers are dependent on the packer—no packer, no market. The packer, too, is dependent on the producer—no producer, no honey.

Why then shouldn't we jointly launch and formulate a plan to jointly provide new uses, new analysis of our product, a better product more efficiently packed, and a unified promotion to provide a more profitable and stable industry for all concerned?

It can be done if each one of us will put a shoulder to the wheel and do our part by joining our local, state and national organizations and participating in the check-off plan. Progress may be slow at the start, but progress we will if each one of us will willingly and earnestly do his part.

(Federation News Letter May-June)

The Market Place . . .

BEES AND QUEENS

THREE BANDED Italian bees and queens —Two extra good strains, Dadant's Starline Hybrids and our regular strain. Starlines, 1 to 25, $1.30; 25 to 100, $1.20; 100 up, $1.10. For the regular strain deduct 25c per queen. Alamance Bee Company, Graham, N. C.

CARNIOLAN and CAUCASIAN untested queens, $1.00 each; 25 or more, 75c each. Tillery Brothers, Greenville, Ala.

CAUCASIAN BEES and QUEENS — Very gentle and good workers. Also easy to handle. 1 to 25, $1.00; 25 up, 90c each. Black River Apiaries, Currie, N. C.

NORTHLAND ITALIAN QUEENS — For production, $1.00 each; 10 up, 90c. Shiri Baker, Rodney, Mich.

LIGHT 3-BAND ITALIAN queens, 80c; 20 or more, 75c. Luther Pickett, Efland, N. C.

GOLDEN ITALIAN bees and queens—Real gentle and easy to handle. Select untested queens, 1 to 25, $1.00; 25 up, 90c. Carolina Bee Farm, Graham, N. C.

3-BANDED QUEENS—1 to 10, $1.00 each; 11 up, 80c each. Satisfaction guaranteed. Dalice E. Crawford, Rt. 1, Haw River, N. C.

NORTHERN BRED QUEENS — Twenty-two years of breeding. The best queens for northern states honey production. $1.00 each. Milton Stricker, Rt. No. 1, Annandale, N. J.

CAUCASIANS — Very hardy, long lived, gentle, good workers, personally raised. Young laying queens, $1.00 each. Fred Brock, McDonald, Tenn.

GOLDEN ITALIAN QUEENS — Bees are very large and gentle, and heavy honey producers. Price 60c each. Guaranteed live arrival and health certificate. Allen H. Gauthier, Hamburg, La.

ITALIANS—Packages, queens. Marts, Rt. A2, Box 846, Vacaville, Calif.

FOR SALE

FOR SALE—146 10-frame colonies of bees and equipment. Spring inspected. Selling on account of death of husband. Mrs. Homer Ross, Rt. No. 1, Poseyville, Ind.

150 empty hive bodies, $1.15 each. 150 60-lb. honey cans, 25c each. 200 shallow extracting supers with drawn combs, $1.50 each. All equipment is patented, 10-frame, painted, in good condition. Will sell all or any part. T. E. Woodrum, Rt. No. 2, Neosho, Mo.

FOR SALE—100 double broodnest swarms and equipment. Crop included. All is 10-frame G. B. Lewis. Henry Einhaus, Seneca, Ill.

FOR SALE—Steam boiler with oil burner, McElhany uncapping machine and Brand capping melter, Woodman steam wax press, Lifetime eight-frame extractor, $400.00. Dovetailing machine for hive bodies, in perfect condition, $200.00. P. M. Williams, Castleberry, Ala.

FOR SALE — 1300 once used 60-lb. cans with cartons. Just like new, 40c each. Also 3000 60's without cartons, 25c to 30c each, or take them and fill them up with honey for us. Take all you have. We want 1000 cases or less of comb honey also. Please state price. Honey Moon Products Co., P.O. Box 85, 39 E. Henry St., River Rouge 18, Mich.

FOR SALE—1 3-frame, 1 4-frame extractor. $15.00 each. M. Kinsman, Rt. No. 1, Kankakee, Ill.

30-frame Radial extractor. Two season's use. Like new. $125. Complete with motor stand, pulley and honey gate. Dan S. Crane, 421 N. Walnut St., Shelbyville, Ill.

TWO HONEY MIXING AND STORAGE TANKS. Closed, double jacketed enamel lined with agitator. 1,200 and 5,000 pound capacity. A. I. Root Company, Council Bluffs, Iowa.

1100 8-frame used queen excluders, in good condition, for $1000. Also one slightly used McElroy uncapper, $100; and 400 shares of preferred stock in the Finger Lakes Honey Association. Mrs. Roy Rabbitt, 319 North Berkeley Way, Medford, Ore.

COMPLETE extracting equipment for 400 hives. Roy Cox, Elma, Wash.

BRADSHAW CAPPING PRESS, in good condition. Old Taylor Honey Co., Harlan, Iowa.

500 COLONIES, equipment to run 1250 colonies. Lease or sell. Box Y, c/o American Bee Journal.

FOR SALE—8-frame Root equipment for 700 colony apiary. Write for details. E. H. Wadleigh, Monte Vista, Colo.

HONEY and BEESWAX WANTED

HONEY NEEDED — Cut comb and both white and light amber extracted. Describe what you have. Clover Bloom Honey Co., Inc., Box 56, Minco, Okla.

WE ARE PAYING top prices on beeswax and honey shipped to one of our plants. Sioux Honey Assn., Lima, Ohio; Rogers, Texas; Anaheim, Calif.; Tacoma, Wash.; and Sioux City, Iowa.

HONEY WANTED—We pay cash. Tideswell Supply Co., 2711 No. 63 St., Omaha, Nebr.

WANTED — Honey and beeswax. State what you have and price. Roscoe F. Wixson, Dundee, N. Y.

HONEY WANTED—All grades and varieties. Highest cash prices paid. Mail samples. State quantity. HAMILTON & COMPANY, 2613 South Yates Ave., Los Angeles 22, Calif.

WANTED—Light amber to dark honeys for cash. Send price, etc. Any quantity. R. Griggs, Hancock, Iowa.

WANTED—Honey, amber or light, in any amount. Send sample for prices. Holland Honey Cake Co., Holland, Mich.

WANTED—Extra white and light amber honey. Let us ship you the containers. Sell us your honey for CASH on delivery. The Hubbard Apiaries, Manufacturers of Bee Supplies and Comb Foundation, Onsted, Mich.

WRITE FOR SHIPPING TAGS and current quotations on rendered beeswax. Any amount from one pound up bought. If you have 25 pounds or more, save 25% by letting us work it into foundation for you. Walter T. Kelley Co., Clarkson, Ky.

CASH PAID for white and amber extracted honey. Send samples and state quantity available. Prairie View Honey Co., 12303 Twelfth St., Detroit, Mich.

HONEY FOR SALE

FOR SALE—22 cans sweet clover honey in 60-lb. cans. Chester Scott, Bigelow, Mo.

WHITE CLOVER HONEY in sixties. Ralph Gamber, 910 State, Lancaster, Pa.

HONEY LABELS

Improved designs, embodying color, balance, simplicity, and distinction. Please send for free samples & prices.

C. W. AEPPLER COMPANY

Oconomowoc, Wisconsin

POSITIONS AND HELP WANTED

IMMEDIATE OPENINGS for experienced and inexperienced help. Stewart Apiaries, Fairfax, Mo.

SUPPLIES

BRAND MELTERS and all kinds of bee supplies. Catalogue free. Hodgson Bee Supplies Ltd., 565—13th Ave., New Westminster, B. C.

HEAD NETS—100% nylon—$1 each or 3 for $2. Challenger Tackle Co., 7544 Prairie Ave., Chicago, Ill.

SMOKER FUEL—Sumac berry bobs when once kindled and a little grass stuck on top to help keep them in place, make one of the most pleasant, long lasting, non-irritating, and coolest of smokes for handling of bees. It is used almost 100% by beekeepers in areas where it grows. One pound will last for several hours. Sample one pound shipment, 25c postpaid; 50 pound lots, $5.00; 100 pound lots, $8.00 f.o.b. Grand Rapids. A. G. Woodman Company, Grand Rapids 4, Mich.

HAVE YOU TRIED our bee feeder? "It's a honey." Write for prices. Dealers supplied. Honey Flow Co., 316 W. 3rd St. So., Newton, Iowa.

THE BIGGEST BEE SUPPLY CATALOGUE PUBLISHED (64 pages) free for the asking. Big factory manufacturing a complete line of wooden goods, comb foundation, metal goods, veils and gloves, carloads in stock, daily shipments, save 20%. WALTER T. KELLEY CO., CLARKSON, KY.

NOW READY — Your copy of the BIGGEST MONEY SAVING CATALOG of quality bee supplies at savings up to 25%. Prompt shipment—100% satisfaction guaranteed. WRITE TODAY! Mondeng Mfg. Co., Minneapolis 5, Minn.

WRITE FOR CATALOGUE. Quality bee supplies at factory prices. Prompt shipment. Satisfaction guaranteed. The Hubbard Apiaries, Manufacturers of Beekeepers' Supplies, Onsted, Mich.

SEEDS AND TREES

HONEY PLANTS our specialty. Catalogue on request. Pellett Gardens, Atlantic, Iowa.

MISCELLANEOUS

AUSTRALIAN BEEKEEPING — Read all about it. $1. Australian honey flora. $1. Rex. Peacock, Kerang, Victoria, Australia.

RANCH MAGAZINE—Do you find it difficult to secure information about sheep and sheep ranching methods? The SHEEP AND GOAT RAISER reaches more sheepmen with more information of range sheep than any magazine published. Subscription $1.00. Hotel Cactus, San Angelo, Texas.

BEES removed from house or tree to hive without touching either house or bees. Bees will then move honey into hive. Save property, honey and bees with my method. Send $2 for details. Satisfaction guaranteed. George Hawkins, Rt. 1, Lawson, Mo.

KNOW interesting facts about the bees of India through the INDIAN BEE JOURNAL, published in English by the Bhupen Apiaries (Himalayas), Ramgarth, Dist. Nainital, U.P., India, and obtainable from them. Subs. Rs9/-, or S.15/-, or $2.25 yearly. Sample copy, post free, Rs.1/8/-, or S.2/6 or 40c (International money order). Payment in mint postage stamps of your country accepted.

CROPS and MARKETS

by M. G. Dadant

Condition of Overwintered Colonies

In most northern areas there was considerable loss because of little flow in the fall, so less honey and less young bees for winter, which, combined with a long winter in some sections, resulted in rather heavy losses. Bees that did come through, however, have built up in excellent shape and many divisions have been made because of the difficulty of getting packages. Such packages as were received, and the divisions made, and the overwintered colonies are rapidly approaching the honeyflow in good condition.

Package Bee Conditions

Package bees were hard to get because of the heavy freeze in the South. The southern shippers are to be complimented on producing as many packages as they did. They called on everyone they could get to help out in the emergency and they used every effort to deliver packages as early as they could. Even so, many packages were received late and naturally, they are not yet in too good shape for the honeyflow. However, in many places the flow is not expected until July 1, and the packages then should be in satisfactory condition. There is one condition that slowed down developments and that is the cool weather in mid-June. Colonies gaining strength were then apt to be short of "sitting room" and so, according to reports, there may be an unusual amount of swarming. On the other hand, in colony buildup, pollen conditions were not as good as might have been anticipated, and so the strength of the colonies will have suffered some in consequence.

Honey Plant Conditions

Honey plant conditions in the southern areas were unsatisfactory because of drought, followed by cold. Plant conditions in Arizona, New Mexico, Alabama, Florida, Georgia and South Carolina were hurt, so early crops have suffered likewise.

In intermountain areas, conditions are about normal except that Utah, Nevada, and Idaho complain of the shortage of legumes. In Montana, plants are perhaps two weeks late. Other mountain sections appear satisfactory.

In the central West, plant conditions at this writing (June 18) seem to be good. While there are areas of shortage, in many places both yellow and white sweet clover and white Dutch are in abundance. One Ohio reporter says this is apparently going to be a "white Dutch clover year." This condition exists from New England through the entire northern areas, and out to the plains states, except for some complaints of drought in Pennsylvania and some difficulty in Maryland and West Virginia.

In the Canadian provinces, Quebec alone complains of drought and delayed conditions. From Ontario westward apparently conditions are now improving as one moves westward to British Columbia. In some cases in Eastern Canada, crops are from one to two weeks early whereas in the western areas probably a week or ten days late. However, plant and bee conditions seem to be much above 1954.

California has been both hot and cold with rains in mid-May apparently making desirable conditions for desert plants. However, the moisture has not penetrated any great distance and in some sections drought is going to interfere. Many sections among orange groves are also complaining, although moisture there probably has been enough if the weather proves favorable.

Crops So Far

So far as surplus crops now exist, Florida's was not as heavy as last year although it was fair. Gallberry, tupelo and even palmetto seem to have reached the point of almost complete failure and there are great numbers of discouraged beekeepers, even through Georgia and Alabama, which for the past four years have had excellent conditions except for the drought in 1954. The Rio Grande Valley had a failure in orange. California will have perhaps an average to a short orange crop, with the desert crop still in question; alfalfa probably normal if not interfered with too much by heavy seed production and consequent curtailment of surplus.

Prices

Apparently few prices have been quoted on new honey, although much Florida orange sold at 14 cents and we understand 13 to 13½ cents has been offered for some orange in California. The old crop honey is pretty well cleaned up, prices running as high as 16 cents, with an average of perhaps 13 to 14 cents. However, there has not been enough honey distributed yet to give an idea what the market will be. It will depend on the crop in the clover areas of the North and in the intermountain territories.

Summary

Plant conditions in all northern areas are normal or better; in southern areas, under normal with short crops; in the sourwood belt, still to be determined; in intermountain areas, mostly satisfactory; California, not much above average. The four weeks from June 20 to July 20 will determine what the outcome is to be.

In Memoriam

Ross Wyant

Ross E. Wyant, Sylvania, Ohio, local beekeeper and plumber, recently died of a heart attack at the age of 64. He was born in Bradner, Ohio, but spent most of his life in Sylvania. He had several hundred colonies in southern Michigan.

(Sam Knepper, Sylvania, Ohio).

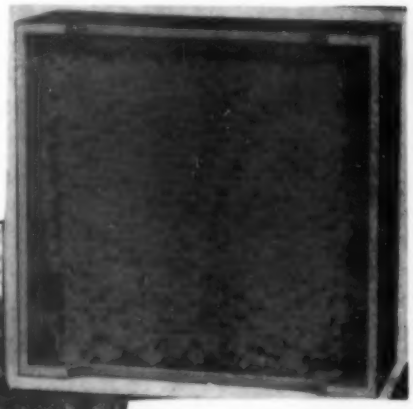
Who Has the Bees? . . .

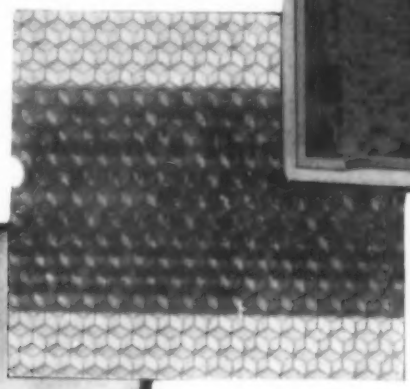
The question is suggested by an advertising letter from Farm Quarterly. According to the facts given, now one third fewer farmers produce one third more food and farming is more of a business. Maybe a similar figure would apply to beekeepers. Fewer beekeepers now produce a larger share of the total crop. Nevertheless, if we now have 400,000 beekeepers (and no one knows that we do), can 10% of them be rated as either part time or full time commercial beekeepers? Would 5% of them be rated as full time commercial beekeepers? Are the others, the vast 90%, hobbyists?

We could argue these questions indefinitely. Likely most beekeepers with any substantial number of bees (25 colonies or more) are commercial honey producers. In one name list from a mid-western state 70% of those with bees owned less than eight colonies.

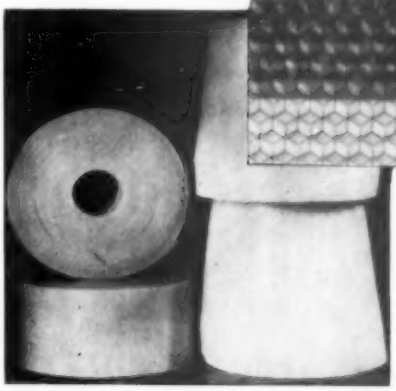
Dadant's Surplus Foundation

Only the finest, whitest, cleanest, sweetest beeswax is chosen to make Dadant's Surplus Foundation. The foundation is so thin and clear you can see right through it and it will give quality section comb honey. The biting quality at the base of the honey is such that the wax crumbles under the tongue; delicate, tasty, downright good.





- ★ Premium grade honey.
- ★ Customers come back for more.
- ★ Fragrant as a bouquet.
- ★ Increases your profits.



Cut Comb Honey

- ★ Fine finish.
- ★ Even surface.
- ★ Packs attractively.
- ★ Draws customers.

Honey markets want honey, cut from the combs and put in cellophane wrappers in cartons, or packed in glass with liquid honey. You must have shallow super combs with honey having a fine finish. Either Dadant's Thin Surplus or Cut Comb Foundation will produce just the kind of honey you want for this purpose.

Dadant's Gilt Edge Foundation

Gilt 4-Edge

Just fit together a Lewis Nailless Topbar frame, then set one of the long Gilt edges of a sheet of Dadant's Gilt 4-Edge foundation into the groove of the inverted topbar. Then fit the bottombar of the frame over the other long edge of the foundation and nail the ends of the bottombar into the side bar recesses using the nail holes already pierced for it. Simple, isn't it? And it takes only a minute of time.

Gilt 3-Edge

Three metal edges, one on each side and one on the bottom with the familiar crimp-wired hooks along the top edge. With a slotted (or two piece) bottombar, slip the long metal edge of the foundation into the slot of the bottombar; then nail the frame wedge under the hooks of the top edge of the foundation. There is no wiring to do as the wires are all in the foundation, saving you hours of time.

Dadant's Crimp-wired Foundation

Dadant's Crimp-wired Foundation makes everlasting combs. Each crimp in each wire exerts a steady pull to keep the pure beeswax sheet in exact center. The wires are especially shaped and embedded for the exact needs of perfect combs. They are of special steel so they do not bend out of shape and the hooks hold any weight the combs can put on them. Gives you combs as permanent as your hives; produces combs of full worker cells that make larger colonies, greater crops, more profit. Hundreds of thousands of these fine combs have been in use twenty or thirty years. Such combs will cost you less and last a lifetime. Two horizontal wires put in by hand will hold foundation at center.

DADANT & SONS, Inc.

Hamilton, Illinois

Lewis-Dadant Branches—Colonie and Montgomery Sts., Albany 1, N. Y.; Stephenson Ave. at 14th St., Lynchburg, Va.; 92 Riverside St., Chillicothe, Ohio; 1010 W. Austin St., Paris, Texas; Rt. 41, S., Hahira, Ga.

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Lewton* is somewhat flexible and may spring out of shape when not in use. But, like good spring steel, it's rough, rugged, and ready when on the job. Our years of testing have proved these facts:

★ **Long life.**
★ **Requires no painting.**
★ **Won't absorb moisture.**
★ **Light in weight, yet strong.**
★ **Sold assembled, ready for use.**
★ **Can be sterilized by blowtorch or steam.**

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My check (or money order) for ..... is enclosed. (@ $2.50 each.)
Signed .....
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